The Relation OF PRELIMINARY SCIENCE TEACHING TO PATHOLOGY.

An Address introductory to the Discussion on Medical Education at the Annual Meeting of the British Medical Association. Delivered on July 1st.

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MR. PRESIDENT AND GENTLEMEN,—The relation of the training in preliminary science to that required in pathology in the medical curriculum is of interest because pathology is in many respects a bridge between the earlier and the later stages. Pathology is anatomical and physiological; it deals with structure and function; in its purview the whole field of abnormalities is included. Without physics and chemistry the development of pathology would be practically impossible. To them the pathologist must resort when he would obtain conceptions and methods for the accurate measurement of living processes. To measure chemical or physical change in the organism is the first step towards a scientific interpretation of the living process.

The student who would become trained in pathology must therefore have a complete knowledge of the elementary principles of physics and chemistry. These sciences serve as an introduction to the whole curriculum, and the courses in these subjects should familiarise the student with fundamental laws and principles on which the whole structure of experimental science is built. The subjects which are taken up during the preliminary period are the foundation for all the later work. It is hopeless to escape from empiricism in medical teaching and practice if we do not take the precaution of beginning the course by a study of physics and chemistry. In the demand for a clear and sufficient introduction to fundamental scientific ideas pathology merely emphasises the claim which is made by all other branches of medicine.

INSTRUCTION IN CHEMISTRY.

The courses in chemistry and physics may well be overtaken to some extent at school, and therefore prior to the medical curriculum. But however we may deal with the general elementary introduction to science, there must remain in the curriculum the chemistry and physics which have direct relation to medicine. This form of chemistry and physics cannot be described as preliminary science. It is the detailed and special study of chemical and physical changes in the substances which are found in relation to metabolism. Physiology, pathology, pharmacology, medicine—each and all constantly require on the part of the student detailed knowledge of the intimate chemistry of metabolism.

Hitherto it has been the practice of the medical schools to include in the courses of physiology, pathology, &c., the chemical instruction required by the particular subject. Recently, however, the plan has been introduced in various schools of giving courses in biochemistry which deal with these problems from the point of view of the chemist. Such courses are valued especially because they give instruction in these metabolic processes in their relation to general chemistry. This the biochemist can teach with a freedom and impressiveness which are of great value in conveying knowledge to the student, and the task of giving instruction of this type is handed over to the biochemist by his grateful colleagues. It is true that it is not the chemical process in itself that is the chief interest to the student of medicine, but the chemical process in relation to the activity of the organ concerned in its production. To take an example: the relation to each other of the various substances which appear in the breaking down of molecules of fat is at the same time a chemical problem and a problem in the physiology of nutrition. Chemical knowledge of the process is the basis on which the study of the process of nutrition rests. It is, therefore, a natural and appropriate subject for the chemical course, and yet it is doubtful if it can be successfully taught in the preliminary period of the curriculum. It is better that the problems of physiological and pathological chemistry should be taught in relation to the courses of physiology and pathology. It is difficult for the student to realise the bearing of the chemical teaching until he has become familiar with the process in the body, for the understanding of which such knowledge is required. To study the process and its chemistry together is the ideal which we should attempt to reach. Hence we should continue the study of chemistry throughout the curriculum. It should at the beginning have place as a preliminary science, but it should continue to be studied in the later years in its application to the interpretation of normal and abnormal organic processes.

How much chemistry should be taught is a question naturally raised at this point. The end to be kept in view is defined by what I have already said. The chemistry of the introductory period, inorganic and organic, must be continuous with and preparatory to all that is required later to understand the teaching of the biochemist when he deals with the chemical changes in metabolism. It would indeed seem natural, therefore, that the direction of the whole teaching should be in the hands of the biochemist. He should begin in the first year by supplementing, if necessary, the general chemical teaching which the students have received at school, and he should extend the work into the sections of organic chemistry and biochemistry which deal with the physiology and pathology of metabolism. It will be necessary for a chemist with such wide responsibility to continue his teaching through several, and possibly through all, the five years of the curriculum. By the unity and continuity of chemical study which would be secured by such an arrangement the student would acquire at each stage the capacity to apply chemical methods of study and interpretation.

THE TEACHING OF PHYSICS AND BIOLOGY.

A similar arrangement would form an equally appropriate method in the instruction to be given in physics. The argument need not be repeated in detail. An introduction to general elementary physics should be given, and this may be obtained wholly or partly in school before entry on the medical curriculum. As the curriculum proceeds in physiology, pathology, general surgery, the special surgery of the eye, the ear, the application of physical methods in medicine, there arises the necessity for special teaching in light, sound, electricity, heat, X rays, radio-activity, &c. As in the case of chemistry, the teaching of physics in relation to the organism is of interest to the student of medicine primarily because of the organic process with which the physical change is associated; but just as we do not propose to leave the teaching of biochemistry to the physiologist, pathologist, physician, and surgeon, so we should commit the teaching of physics to a biophysicist. Unity and continuity is required as in chemistry. In neither case should there be by this arrangement any additional burden placed on the student. The greatest burden which is put upon him by the present curriculum is that of useless knowledge. Time is wasted if spent on studies the interest of which is allowed to lapse at the end of a particular course or after passing a particular examination. The extended teaching which I have proposed would go far to prevent the neglect of the fundamental sciences which takes place under the more haphazard arrangements now in existence. The teachers responsible for the whole course would easily realise what is required at each stage of the curriculum.

The same argument applies, and with still more force, to the study of biology. Pathology, like other branches of medicine, is a form of applied biology. We are too apt to think of animal biology in a restricted sense, as the science of the normal organism. The science has developed its teaching chiefly in the form of morphological description of structure. It is the anatomical or morphological comparison of various types of animal structure that has constituted a large part of the

teaching of animal biology. This forms the introduction to animal biology for the medical student. The normal human organism is studied in detail in the courses of human anatomy and physiology, and it is on a basis of the knowledge gathered in these three courses that the student begins his study of pathology.

STRUCTURAL AND FUNCTIONAL DEVELOPMENT.

In the study of disease the student has to learn the meaning of abnormal structure and function, and in this he has to work out conceptions which the study of the normal may not have brought into prominence. The development of the organism is studied in normal embryology; but in pathology this becomes the basis and the exposition of congenital disease and maldevelopment. To work out the meaning of maldevelopment we have to make use of the laws of heredity and the transmission of structural or functional characters from parent to offspring, and behind the history of the organism and the history of its structural and functional inheritance lies the problem of growth—the nature of growth and the regulation of it as it is seen in cell growth, organ growth, the growth of the body as a whole. In pathological processes in the body growth is disturbed. Sometimes it is diminished, at other times it is excessive; often the growth which results from pathological conditions is partly beneficial and partly harmful. We have to deal with growth associated with pathological irritants; growth associated with hypertrophy in gland or muscle where there is call for increased work; growth which is of the nature of tumour and which assumes a variety of uncontrolled forms partaking of malignancy and revealing absence of the ordinary regulative factors. Disease may be said in general to lead to destruction and disorganisation of the tissues which it attacks. The disorganisation may be followed by recovery in the stages of which the disturbed structure is reorganised or restored more or less completely. To follow the process of destruction or recovery much important study must be directed to the nexus of the various organs with each other in the unity of life.

The margin of function and structure which each organ provides beyond that which is demanded by the bare necessity of bodily activity provides the field within which disease works. When this margin is cut down a point is reached at which the liver or the kidney or the lung or some other organ becomes inadequate. To interpret the functional value of diseased organs requires constant reference to the structural and functional development of the body. Pathological problems are, in a sense, highly specialised, but again we can escape from empiricism in dealing with them only when we give them shape by relating them to general biology and the general study of the development and organisation of the body, and of the origin and correlation of the various organs of which the body is composed. Pathology will be strengthened and simplified in its teaching if the biologist who gave the students their introduction to the general science also continues the teaching in relation to fundamental problems of pathology.

CONCLUSION.

In general my plea is that the present curriculum is wasteful of the students' time because it gives what may be called a general introduction to the sciences, but leaves it to the later teachers or the students themseves to apply the principles and methods of these sciences in the various branches of medicine; whereas a continuity of teaching would concentrate intellectual effort and would thereby attain with much more certainty the standard of work which the curriculum is designed to reach. We must also remember that the student of medicine should be trained in criticism, and for this all-important part of his training the earlier sciences must assume a considerable part of the responsibility. To be a good practitioner of medicine requires that the doctor must possess not only technical knowledge and skill, but also a broad, sympathetic, tolerant conception of life. To secure this nothing could be better than critical reflection on the fundamental conceptions by which the phenomena of life are interpreted.

Medical Experiences IN MACEDONIA AND THE CAUCASUS.

A Lecture delivered before a meeting of the Royal Society of Medicine

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MR. PRESIDENT AND GENTLEMEN,—In no other war area can there have been greater wealth of clinical material from the physician's point of view than in Macedonia and the Caucasus, and in this lecture I shall endeavour to give an account of some aspects of the medical work, which was throughout of absorbing interest. The only drawback was the difficulty, owing to stress of work, of making continued observations on a systematic basis, and I must ask the indulgence of the Society for the fragmentary nature of the records in many of the cases I shall have occasion to quote.

HOSPITAL ACCOMMODATION AT THE BASE.

The accommodation in the base area for British sick during the summer of 1918 comprised 15 general hospitals, most of them containing 1560 beds, a few with 2000 beds. In the preceding summer the number of hospitals was nearly as large, additional hospitals having been provided when it became necessary, owing to the difficulties of sea-communication, to modify the policy of evacuation on a large scale to Malta. The large number of beds thus provided was none too great, and often patients had to be discharged to convalescent depôt earlier than one would have wished in order to maintain the necessary reserve of empty beds for fresh convoys.

The hospitals and convalescent depôts were situated away from the town, by the sea or among the hills, in comparatively healthy surroundings. A group of four hospitals, three of which were hutted, were placed at Kalamaria, on a low promontory about 8 kilometres from "Piccadilly Circus," the centre in Salonika, to which all roads converged. One of these hospitals occupied an ideal position overlooking the sea, with an uninterrupted view across the bay to Mount Olympus in the distance, and even on the hottest day relief was afforded by a fresh breeze from the sea, which made its appearance in the early afternoon with unfailing regularity. Here was the section for cases of tuberculosis, which, as a rule, did very well, and one often regretted the necessity of evacuating these cases, in order to provide much needed beds, to less favourable surroundings in Malta or at home. Adjoining this, and on an equally good site, was one of the two hospitals for sick sisters. Another group of hospitals and convalescent depôts was situated high up among the hills, about 16 kilos. from the town, on the plateau immediately below Mount Kotos, a well-wooded mountain of some 4000 feet, which dominated the Salonika district. A couple of hospitals were placed further away across the bay to the south of Salonika, on the promontory of Karabaroun, with communication by water. This was, perhaps, the healthiest of all the sites, as the promontory was swept by sea breezes, the only drawbacks being the complete absence of natural shade and a certain brackishness of the water, which had the effect on newcomers of a mild saline aperient. There was excellent sea-bathing for convalescents, and, in addition to the hospitals, the colony included two C.D.'s and a rest camp. It was necessary to close these hospitals during the winter, owing to their exposed position and difficulties of communication in stormy weather.

Supplementary to the British hospitals there were four general hospitals for Serbs, staffed entirely by British personnel, two of which were near Salonika and two at Vertekop, about two and a half hours' run on the Monastir road, not far from the Serbian front. The fortnightly visits to Vertekop were always interesting, as, owing to temperament or circumstances, or both, the resisting powers of the Serb to disease were on a different level from those of the British, and common diseases frequently presented unusual features; also, one saw examples of conditions, such as scurvy, that were practically unknown among our own troops. The most attractive medical unit in the command was at Stavros, a four hours' journey to the east, on the shores of a sheltered bay with high-wooded mountains rising steeply behind. The tents were pitched by the seashore,

and between them were well-grown plane trees which gave good shade; the water-supply was abundant, and on the fertile soil all kinds of produce were grown for hospital consumption; it was curious that a well-wooded site like this should be practically free from anopheline mosquitoes. Though nominally a field ambulance, the unit was practically on the scale of a stationary hospital. Closely rivalling Stavros in natural beauties was a unit in the opposite direction at Naoussa, beyond Vertekop, where a C.D. was established in connexion with the Serbian hospitals, high up among beech forests on the slope of a mountain which arose behind the depôt to a height of over 6000 feet. Unfortunately, this was too far away to be used to any large extent by the British, though accommodation was unofficially available for a limited number of officers, and was much appreciated by those who were run down and in need of a holiday.

The Climate of Salonika.

Much has been said in disparagement of the climate at Salonika, but, with all its drawbacks, we might in many respects have been worse off. The heat in the summer was sometimes very trying, especially for those who had to reside in Salonika itself; the hills, which during spring and early summer were covered with a profusion of flowers, towards the end of June became parched and arid and of a monotonous faded yellow aspect, all vegetation being dried up with the exception of patches of the dwarf prickly oak. But, outside the town, the days were few when the heat did not become mitigated in the afternoon by the breeze from the sea, and the nights were usually tolerable. The winter climate was of two kinds—periods of three to five days during which the bitter "Vardar" wind blew from the snow-covered mountains to the north, bringing with it cold rain and a state of indescribable mud, or blizzards of fine driven snow with 20° or more of frost. During these spells transport was a matter of the greatest difficulty, and there was nothing in the climatic conditions to make life attractive except the certain knowledge that in the course of a few days matters would improve, and two or three weeks would follow of perfect weather, practically windless, with cold nights and warm days, when convalescent patients could sit out and enjoy the sunshine.

MALARIA.

The rôle played by the mosquito in shaping the destinies of the British Salonika Force may be partly realised from the fact that the total admissions to hospitals for malaria during the years 1916, '17, and '18 amounted to 161,560. Expressed as a ratio per 1000 troops, this number is equivalent to 1053 per 1000, the ratios for the respective years being: for 1916, 331 per 1000; 1917, 353 per 1000; 1918, 369 per 1000. These figures, large as they are, do not represent the whole incidence of malaria, since they include only admissions to general hospitals, stationary hospitals, and C.C.S.'s. They do not include cases treated at field ambulances and discharged as fit from there, nor cases returning to duty after treatment by regimental M.O.'s, nor do they take into account the numerous instances in which

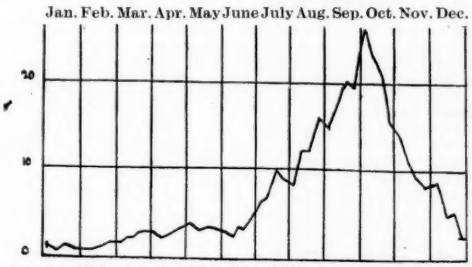

FIG. 1.—*Malaria.*—Weekly admissions shown as a ratio per 1000 troops during the year ending Dec. 31st, 1917.

officers and men with slight attacks carried on without reporting sick. The mortality was at the rate of 2·02 per 1000 troops during 1916, 1·17 per 1000 during 1917, and 1·69 per 1000 during 1918. The last figure is probably too high, as there was an enormous increase in the number of reported deaths from malaria in the earlier part of the influenza epidemic, and the figures undoubtedly include many cases in which death was due, not to malaria, but to influenza or its complications.

The seasonal incidence of the disease is well shown by the accompanying curve (Fig. 1), which is based on the return of weekly admissions during 1917, shown as a ratio per 1000 of strength. It is seen that the first material increase in the number under treatment, representing the earliest fresh infections of the year, was at the end of June, from which date there was a steady rise to a maximum in the beginning of October, followed by an abrupt fall during the latter part of that month and continued through November. The cases responsible for the early part of the flow of the malarial tide are exclusively benign tertian. This is probably due to the fact that subtertian infections die out in the course of the winter, and that from February onwards relapses are generally attributable to the more resistant B.T. parasite. The B.T. relapsing cases act as carriers, from which the mosquitoes become infected as their activity increases in early summer. About the latter part of August the number begins to be appreciably swelled by the inclusion of malignant tertian cases. Coincident with this is a distinct change in clinical type; the severity both of B.T. and M.T. cases is greater, cerebral cases become more frequent, and the death-rate rises. It has been impossible to determine the exact ratio of B.T. to M.T. cases, as such a comparison could only be effected by a complete series of blood examinations; the amount of pathological work entailed by this procedure would have been overwhelming, and in 1917 an order was made that in cases where the diagnosis was clear on clinical grounds blood films were not to be sent to the laboratories. Sufficient data are, however, available to show that the incidence of benign tertian malaria was at its highest in the course of September, and that malignant tertian malaria attained its maximum about four weeks later, by which time there had been a considerable fall in the number of B.T. cases. During the early part of the malarial season the prevailing species of mosquito is *Anopheles maculipennis*. With the appearance of M.T. malaria in August the mosquito ranks are swelled by the addition in large numbers of *Anopheles superpictus*. It might be supposed that there is some causal connexion between the two events, but I am told by Colonel Wenyon that there is no direct evidence that *A. superpictus* possesses any superiority over *A. maculipennis* as a carrier of M.T. infection; both species appear to infect themselves equally readily with M.T. parasites.

Clinical Features.

In attacks of primary B.T. malaria the clinical phenomena usually formed so definite and characteristic a picture as to be recognisable even by those who had had no previous practical knowledge of the disease. But the same cannot be said of the manifestations of subtertian and recurrent malaria, and a very short experience in Macedonia sufficed to bring home the difficulties with which diagnosis might be beset.

In malaria the parasitic invasion, which is a general one, often falls with disproportionate emphasis on some special tissue or organ, thereby producing a symptom-complex which may lead to a remarkable simulation of other forms of disease. Thus cases were admitted with symptoms of an acute enteritis, with frequent watery stools, sometimes fæculent, sometimes containing blood and mucus. The clinical resemblance to dysentery might be very close, but no dysenteric organisms were present, and in many cases an examination of the blood disclosed evidence of malaria. The condition yielded rapidly to prompt treatment with quinine, and there is every reason for regarding these as cases of malarial enteritis. In other cases the intestinal symptoms were more severe, the stools being profuse and watery and associated with vomiting, collapse, and cramps, simulating cholera. Other cases were seen of prolonged pyrexia of indeterminate type, in which one or another member of the enteric group was suspected, and it was only after weeks of illness and repeated blood examinations that the nature of the case could be proved by the demonstration of parasites in the peripheral circulation.

Difficulties in Diagnosis.

A mistake made by almost everyone at some stage of his experience was the diagnosis of appendicitis in cases of malaria where initial symptoms of marked pain and tenderness with muscle rigidity in the right iliac region were prominent, and in some of these instances an opportunity was provided by the surgeon of proving, by direct observation, the healthy character of the appendix. The absence of anything like a definite tumour, and the results of blood examination, including differential count of leucocytes, were

the distinguishing criteria in these cases, though it must be allowed that, exceptionally, the simulation of appendicitis was so close that the matter could only be decided by an exploratory laparotomy. Further pitfalls for the unwary were provided by cases of malaria with lumbar pain and a transient hæmaturia, rapidly subsiding under quinine; cases with symptoms of acute nephritis also rapidly controlled by quinine; cases with acute gastric symptoms and hæmatemesis; cases of acute pleurisy with effusion, the fluid sometimes containing blood; cases with acute pulmonary symptoms, cough and copious purulent sputum, often streaked with bright red blood and signs of a patchy consolidation of the lung; cases with acute mental symptoms; cases with coma of abrupt onset, resembling apoplexy; cases with epileptiform fits, or symptoms suggesting a cerebellar or a bulbar lesion; cases simulating meningitis with prostrating headache, head retraction, and rigidity of neck muscles; in an example of this, occurring on a hospital ship and diagnosed as a fulminant form of cerebro-spinal fever, the blood examination showed a heavy infection with B.T. parasites.

It is not intended to discuss the exact pathology of these conditions, nor to make any attempt to define the extent to which the symptoms in some instances may be due to a complication of the initial malarial invasion by an added bacterial infection. What I wish to emphasise is the importance in the first place of not overlooking the malarial factor; and secondly, of giving due weight to this factor in determining the treatment to be adopted.[1]

With a widening realisation of the manifold and far-reaching activities of the malaria parasite, there arose an almost inevitable tendency on the part of the clinician to fall into a different error, and, attaching undue weight to probabilities, to arrive too readily at a diagnosis of malaria in doubtful cases. Such diverse post-mortem conditions as cerebral abscess, meningitis, hepatic abscess, gastric ulcer with perforation, appendicitis, were found in cases diagnosed as malaria. These mistakes were sometimes due to lack of thorough examination, and therefore unjustifiable; but, on the whole, it is remarkable that the standard of diagnosis was so high, and serious mistakes were so infrequent, considering the strenuous conditions of work in the hot season when hospitals were crowded and heavy convoys were coming in at short intervals, and bearing in mind that of medical officers arriving in the country there were very few indeed who had any previous experience of tropical diseases.

The difficulties of diagnosis were enhanced in the influenza epidemic when the two infections frequently ran concurrently in the same individual; and the clinical threads became still more tangled when, as happened at one time, a considerable outbreak of sandfly fever was added to the prevailing epidemics of malaria and influenza. There were many difficult cases in which the only proof of malaria lay in the demonstration of the parasite in the blood. An ideal course would have been the examination of a blood film in every case; but with such large numbers this procedure was impossible; and in order to relieve laboratories of unnecessary strain it was ruled that blood films were not to be taken in straightforward cases progressing favourably under quinine treatment. The information afforded by examination of the blood was especially useful in the more chronic forms of malaria with irregular pyrexia, in which there might be long periods without demonstrable parasites in the peripheral blood. The diagnosis in these cases was often proved by repeated blood examinations, resulting sooner or later in a positive finding. In the apyrexial stage the information afforded by a white blood corpuscle count was always valuable, as the combined relative preponderance of large mononuclear cells, with reduction in the total number of white cells, gave a picture which was the reverse of that obtaining in many of the acute inflammatory conditions from which malaria had to be distinguished. Enlargement of the spleen taken by itself was of little help; but a palpable and tender spleen, or tenderness over the splenic area combined with increase upwards of the splenic dullness, was valuable evidence of acute malaria.

After-effects of Malaria.

The after-effects of malaria were numerous, and examples were commonly to be seen not only in the wards of general hospitals but also in the various special departments of the medical service. In the cardiological department a large proportion of the cases of D.A.H. with unduly sensitive exercise-response were traceable to malaria. In the neurological department, in addition to cases of peripheral or central lesions of the nervous system directly due to malaria, the influence of the disease as a contributory factor in various functional conditions was clearly manifested. In the mental department a majority of the cases under treatment was attributable to the same cause. In an analysis published in THE LANCET of Jan. 3rd by Major A. T. W. Forrester, R.A.M.C., who was latterly in charge of the department, it appears that the commonest type of psychosis following malaria was either some form of mental confusion or depression. The outlook in these, as in other post-malarial psychoses, is favourable, and after a course of treatment it was generally found possible to transfer cases to the general wards, whence they could be sent home by hospital ship as ordinary patients.

No one passing through the malaria wards of any general hospital could fail to be impressed by the large proportion of cachectic cases, with profound anæmia, enlarged spleen, marked wasting, more or less pyrexia, and persistent tachycardia increased on any slight exertion. Very low blood counts were recorded—e.g., 900,000, 880,000, 810,000, and in one case 690,000. Accurate hæmoglobin estimations were unfortunately seldom available, as many of the instruments had deteriorated through climatic influences, and the colour readings were not reliable. In some instances the blood picture was of the "pernicious" type, with poikilocytosis, megaloblasts, and a high colour-index. In others the clinical picture was that of pernicious anæmia, + a large spleen, + myelocytes in the blood. In other cases there was an aplastic anæmia with little or no attempt at repair. In two cases at least blood was transfused. One of these, a patient with M.T. malaria and profound anæmia, under the care of Major A. C. Sturrock, R.A.M.C., was transfused twice, 18 ounces of blood being introduced on the first occasion, 24 ounces on the second. Previous to transfusion the patient was going rapidly downhill, and it seemed that a fatal issue could not long be delayed. The immediate effect of the first transfusion was very striking, but it led to no permanent response on the part of the blood-forming tissues, and again the patient lost ground, and a fortnight later was rapidly approaching his former condition. The second transfusion was followed after a short interval by a gradual and lasting improvement in the blood state, the first evidence of returning functional activity being a remarkable increase in the white corpuscle count from 3200 to 12,300, this leucocytic phase definitely preceding the period of red cell reconstruction. The patient was evacuated by hospital ship three months after his first transfusion. A full account of this interesting case will be duly published by Major Sturrock, who has kindly supplied me with the above details.

Treatment.

I do not propose to spend time in describing the routine measures of treatment which came to be adopted as the result of our experience of malaria in Macedonia. I have dealt with these in some detail in a recent article in THE LANCET (Jan. 24th, 1920), and will here limit my remarks to the discussion of certain points of general interest.

In endeavouring to estimate the value of quinine in the treatment of malaria one is at once impressed by the remarkable contrast between its controlling influence over the acuter manifestations and its comparative failure to prevent relapses in the more chronic forms. In acute malaria the results obtained by quinine properly administered and in sufficient quantities are little short of marvellous. As our experience grew the tendency was to give increasingly large doses in primary attacks, as it was found that this was the only stage of the disease at which permanent results in the sense of preventing relapses could be hoped for. In cerebral malaria the prompt use of intravenous quinine undoubtedly saved many lives. But as a means of controlling the incidence of relapses in recurrent malaria the efficiency of quinine was found to be on a very different plane. Numerous observations were made, some on a considerable scale, having for their object the comparison of large bodies of men; others in special malaria wards, where, with comparatively small numbers to deal with, it was possible to carry out a systematic comparison of various methods on a scientific basis. The practical outcome of an immense amount of work was the realisation of the impossibility of eradicating the malarial parasite from the system in cases of relapsing malaria by any method of treatment. While quinine was being taken in effective doses the disease was kept more or less under control, but on the cessation of treatment relapses again made their appearance, and after a few weeks became as frequent as in the period before the treatment was begun. The best results in relapse-control were obtained

[1] Lieutenant-Colonel A. W. Falconer, R.A.M.C., in an article on The Pulmonary Manifestations of Malaria, in the Journal of the Royal Army Medical Corps, February, 1920, describes a group of cases presenting the physical signs of more or less extensive consolidation of one or more lobes. He considers that in most of these cases the physical signs depend on massive collapse and not on true consolidation, and regards the condition as representing a pure malarial phenomenon. I was unfortunate in seeing very few cases in which the physical signs could be interpreted as due to pulmonary collapse, and formed the opinion that the most common pulmonary complication of malaria was a fine-tube bronchitis, with patchy consolidation of one or both lungs, probably due in all cases to a superadded infection.

in the special observation wards, under the direction of Major A. G. Anderson, R.A.M.C., by the "week-end" system of 30 gr. of quinine on each of two successive days in each week; an important advantage of the method is that treatment can be continued for an indefinite period. Under this system the percentage of non-relapsing cases was raised to 78, as compared with 32 per cent. in cases in which no quinine was given except for the treatment of relapses as they occurred. But for all its limitations no drug was found to exceed, or even to approach, quinine in efficiency. At one time with the introduction of galyl it was hoped that a parasite destroyer of considerable power had been discovered, but the promise of early trials was not fulfilled, and although the preparation undoubtedly possesses some parasite-destroying properties, specially in subtertian cases in which quinine has been pushed to the limits of tolerance, its chief value was found to lie in stimulating the blood-forming organs in cases of profound cachexia and in the anæmia of blackwater fever.

Methods of Administration of Quinine.

On the much-debated subject of the channel by which quinine may with the greatest advantage be introduced, a very decided impression was formed that a given quantity of quinine is more effective if injected intramuscularly than if taken by the mouth. It is difficult to say how far this impression was correct; observations made in the Special Malaria Laboratory on the rapidity with which parasites disappear from the blood and the rate of quinine excretion suggests that the advantage lies with oral quinine. Personally I hold the view that if the desired effect can be obtained by oral quinine there is no justification in submitting the patient to the inconvenience of intramuscular injections. But instances in which quinine requirements could not be met by the oral method were very numerous, and the value of the alternative channel was amply proved in such conditions as vomiting or intestinal disturbance, when absorption from the alimentary tract is impaired, and in cases of pernicious type, where it is imperative to produce a greater effect than can be obtained by mouth administration only, and in cases of cerebral malaria as a supplementary measure to intravenous injections. The risk of local complications is practically negligible if ordinary precautions are taken to prevent such mishaps as sepsis and injury to nerve-trunks. In a recent number of the *Journal of Hygiene* (October, 1919), Colonel L. S. Dudgeon has drawn attention to the serious degree of necrosis which follows intramuscular injections of quinine in mules and rabbits, and has suggested that medical officers and officers in charge of divisions in the Salonika hospitals were not fully alive to the injuries they might inflict on their patients. It may be said that, apart from cases of faulty technique, and a few instances of extensive necrosis that followed intramuscular injections in patients who were debilitated from the effects of dysentery, such untoward results were practically unknown in our clinical experience. The number of injections given was enormous, and there is no means of accurately estimating them; but assuming that each of 12 medical officers in each general hospital had occasion to give one intramuscular injection on each day during the malarial season of, say, 100 days—an assumption which is undoubtedly considerably below the mark—the total number of injections for the season would amount to 18,000, and yet with the exceptions mentioned above, it was the rarest event for any ill-effect to follow beyond a localised induration which rapidly subsided, leaving no permanent disability.

The treatment of malaria in patients who at the same time were suffering from dysentery presented special difficulties, as on the one hand oral quinine was badly absorbed and often of little use, and on the other hand there was the risk of intramuscular injections, if repeated, leading to serious damage to the muscle. With this combination of diseases it it was often impossible to push quinine to the same extent as in a case of uncomplicated malaria. Many of the acute Shiga cases showed a marked febrile reaction, and in order to assess the pyrexia at its true value, the examination of blood films was found to be quite as important, if not more so, in the dysentery hospitals as in any other.

Symptoms Resulting from Administration of Large Doses of Quinine.

Of unfavourable symptoms as the result of the large doses of quinine which it was often necessary to give we had fortunately small experience. A few cases of idiosyncrasy were seen in which a moderate or even a small dose of quinine consistently gave rise to hæmoglobinuria. An instance of this was met with in a Greek boy, who had had malaria and was given a dose of quinine, with resulting hæmoglobinuria and the rapid development of a very marked anæmia. It was thought the matter might be a coincidence, and as there were special reasons for quinine treatment a further dose of 10 gr. was given after a short interval with the same dramatic result of an intense hæmolysis and severe anæmia. This condition should be sharply differentiated from blackwater fever, which I believe comes and goes quite independently of quinine. A variety of skin lesions, such as erythema, scarlatiniform rashes, urticaria, and less commonly purpura occurred in definite association with quinine treatment. More serious than these was a condition of exfoliative dermatitis, of which I saw two examples. In each there was a protracted illness, in the course of which the exfoliative condition became generalised, and ultimately septic infection occurred, notwithstanding the most careful nursing, and the patient succumbed. The total duration of illness in one of these cases was six months.

In the course of 1917 12 cases of quinine amblyopia were reported. Further cases occurred in 1918, but I do not know the exact numbers; they were fewer than in the previous years. Of the 1917 cases, two followed the taking by mistake of a large but unknown quantity of quinine; in one two "mouthfuls," in the other four to six tablespoonfuls of quinine in solution were taken. The remainder were cases of severe malaria in which the need for pushing quinine in large doses was imperative. Most of these were cases of subtertian infection; in three the clinical condition was complicated by blackwater fever.

One patient, an officer, while on 30 gr. daily, developed cerebral symptoms and was given while unconscious 70 gr. of quinine intravenously and 90 gr. intramuscularly, 160 gr. in all. On regaining consciousness he was amblyopic. There was a gradual but slow return of vision, and when evacuated by hospital ship several weeks later there was still a considerable degree of amblyopia. Another case, of M.T. malaria with multiple rings, was given on Oct. 14th 30 gr. of quinine intramuscularly; on Oct. 15th 60 gr., half intramuscularly, half by mouth; and on Oct. 16th 60 gr. intramuscularly. After the evening dose he could hardly see, but the pupils reacted well to light. At 8 A.M. on Oct. 17th he was totally blind with widely dilated pupils which did not react to light. In the evening he could see a little. On Oct. 18th he was delirious, but apparently could see. On the next day his malarial symptoms were so urgent that it was decided after careful consideration to give more quinine, and 15 gr. were administered intramuscularly. After the injection there was rapid dilatation of the pupils and he became totally blind with pallor of the discs and contraction of the retinal arteries to a mere thread. On the following day he was given galyl, but in the evening the general condition was so grave that it was decided that further quinine treatment was imperative, since it afforded the only hope of saving his life, and that it must be undertaken even at the risk of permanent damage to the sight. Further doses of intravenous quinine were given, but the treatment was unavailing and the patient died.

In a third case of cerebral malaria 55 gr. of quinine were given on Nov. 21st, 60 gr. on the 22nd, and 20 gr. on the 23rd. He then became completely blind, and when I saw him a few hours later the pupils were widely dilated, failed to react, and the fundus was pale with very small thread-like arteries. No further quinine was given after the onset of blindness, but notwithstanding this there was not the slightest recovery of vision, and the patient was evacuated by hospital ship several weeks later, still blind. In this case continuous sluggish movements of the iris were observed independently of light stimulus.

These cases fall into three groups: (1) Those in which there is fleeting amblyopia followed by full recovery of vision; (2) cases of incomplete recovery in which useful vision is restored but with a varying degree of lasting contraction of the fields; (3) a comparatively small group in which blindness is permanent.

The Y Scheme.

Owing to increased submarine activity in the first half of 1917, facilities for invaliding by sea became greatly restricted, and there ensued a gradual accumulation in the Salonika command of men whose usefulness for military purposes was practically nil, since by reason of repeated attacks of malaria they spent the greater part of their time at hospitals and convalescent depôts, in many cases being readmitted from C.D. to hospital for a malaria relapse before their period of convalescence was completed. These men were not only unfitted for active service and an unnecessary burden on the military machine, but as possible carriers they constituted an actual danger to the community. On the other hand, there was a fair prospect that under less trying climatic conditions a proportion of them would recover to a sufficient extent to be of use in the home command or in France. These circumstances led to the inception and organisation of the Y scheme, and by the latter part of December, 1917, the necessary arrangements had been completed and the first drafts were evacuated from Salonika under the scheme. The men were chosen with the greatest care, every case being inspected either by the D.M.S. or the consulting physician before being passed as suitable for evacuation. The scheme worked well, and by Oct. 31st, 1918, a total number of 26,001 officers and other ranks had been evacuated, to the great advantage both of the command as a whole and of the men themselves. I am told that these officers and men, not only useless but a danger to their companions in the East, have in a large proportion of cases regained their health and strength, and have been responsible for much good work both at home and on the Western front.

Malaria in the Caucasus.

The shifting of the troops after the armistice from Salonika to the neighbourhood of Constantinople and to

the Caucasus was followed by a marked improvement in the health of the army, and at the same time there was a considerable change in the character of the sickness. The dominance of malaria over all other conditions dwindled, and diseases, such as typhus, small-pox, and relapsing fever, of which only occasional isolated cases cropped up in Salonika, made their appearance in increasing numbers during the early spring of 1919. Thanks to protective measures and early isolation of cases, these diseases were always under control, and did not assume anything approaching the dimensions of the epidemics by which large sections of the Turkish and Russian armies were devastated. The approach of the malarial season was awaited with some curiosity, as we were anxious to see how far the prediction of a heavy malarial incidence in this new country would be fulfilled. In June, when I had an opportunity of visiting the medical units in the Caucasus, except for recurrent cases carried over from previous seasons, there was no malaria. My first note of primary malaria was on July 14th, when a man from Batoum, who came out from home in December, 1918, was admitted to a general hospital in Constantinople with a B.T. infection. There may have been a few isolated cases before this, but, in contrast to our experience in Salonika, primary malaria in the early summer in the Caucasus was a negligible quantity. On a subsequent visit in the latter part of August the state of things was very different, and there were serious outbreaks of malaria in many parts of the country. At an aviation post at Petrovsk, on the shores of the Caspian, 50 out of 150 men had gone down in the course of a fortnight. A battalion on its way to Shusha, a post among the hills, had its orders changed while en route, and encamped at Barda on the plain, on a site chosen, among other reasons, for its propinquity to a stream. I was told by the C.O. that no mosquitoes were noticed until about 10 days later, when men began to go down with malaria. I visited the battalion a few weeks later after they had moved to a healthy camp on high ground above Tiflis, and by that time out of a total of 305 N.C.O.'s and men 303 had fallen victims to malaria. A large proportion had been sent into hospital, but fresh relapses were occurring every day, and it was with great difficulty that fatigue parties could be mustered for the performance of the ordinary camp duties. At this period there was a general movement of troops in progress from Baku and Tiflis to the Black Sea coast at Batoum, where malaria was also prevalent, most of the available camping-ground being heavily infested by anopheline mosquitoes.

BLACKWATER FEVER.

During the year ending Oct. 31st, 1918, 136 cases of blackwater fever were reported in the Salonika command, of which 36 died, giving a case-mortality of 26·5 per cent. In the previous year only 18 cases were reported. The circumstances of the two years are not strictly comparable, as in the course of 1916 malaria cases in large numbers were being invalided to Malta, and during the following winter blackwater fever was common in Malta. Owing to submarine risks and consequent restrictions in sea-communication between Salonika and Malta the evacuation of malaria cases on a large scale became for the time impossible, and the accumulation of these cases in Salonika was doubtless largely responsible for the rise in the blackwater figures. The chart (Fig. 2) shows the seasonal incidence of the disease; it is seen that the great majority of cases occurred between December and April, with a maximum in February, and that during the summer there were no cases except for a short outbreak during September. This happened to correspond with the military advance, and is probably related to the strenuous conditions and special hardships of that time. During the winter there were three short spells of exceptionally severe weather. The first of these was in early December, and coincided with the beginning of the blackwater season; the second was in early January; and the third, at the end of March, may have been responsible for checking the fall in the number of blackwater cases that had already taken place. There was no specially severe weather in the last three weeks of January or during February, when blackwater fever attained its maximum incidence.

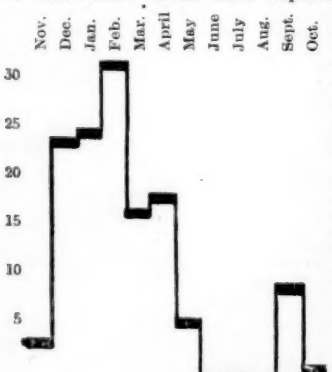

FIG. 2.—*Blackwater fever.*—Number of cases reported monthly during the year ending Oct. 31st, 1918. The heavy lines represent the months as given above.

The Relation of Blackwater Fever to Malaria.

The outstanding feature in the ætiology of blackwater fever is its relation to malaria. Of a series of 78 cases which I had special opportunities of investigating, in all except one a definite history of malaria was obtained, and seeing how prevalent malaria was it is more than probable that this single case was really no exception to the rule that malaria is an invariable antecedent of the condition. But notwithstanding this general relationship, it was rare to find evidence of more than slight malarial activity during the actual blackwater attack. In only 27 per cent. of a series of 58 cases in which special care was given to the examination of the blood were there positive findings, and in nearly all of these the number of parasites present was very small. The type of parasite was B.T. in seven cases, M.T. in four, and indeterminate forms, probably M.T., in five cases. That some agent other than the malarial parasite is the determining factor in the acute hæmolysis of blackwater fever is further suggested by its seasonal incidence, which in Macedonia is at its height not during the malaria season, but at a time of year when malarial activity is at its lowest level. What the determining factor is remains at present obscure. No support was found for the hypothesis that quinine is the activating agent. On the one hand, blackwater occurred in cases in which no quinine had been taken for a considerable period; on the other hand, in several cases quinine was given in large doses without prolonging the period of blackwater; it was the practice of some M.O.'s, in the belief that blackwater fever was the expression of a specially malignant type of malaria, to treat the condition energetically with quinine, and I have many charts which illustrate the rapid and complete clearing of the urine under these conditions.

Clinically the cases presented no special features. The abrupt destruction of enormous numbers of red corpuscles, leading to a drop to 30 per cent., or even 20 per cent., of the normal number; the state of collapse with extreme pallor and small compressible pulse; the rapid darkening of the urine with characteristic absorption bands; the pyrexia with shivering, vomiting, headache, and lumbar pains all went to form a picture which differed in no essential from that described in connexion with outbreaks elsewhere. The average duration of hæmoglobinuria was three days; the longest period was five days; in one case characteristic dark red urine was passed on a single occasion only; all subsequent specimens were clear. Two symptoms we learned to regard as of specially grave significance—jaundice and suppression of urine. Enlargement and tenderness of the liver, with slight icteric staining of the skin, was a common feature of nearly all cases; but deep jaundice was a symptom only of the more serious cases and was nearly always followed by death; in every one of 30 fatal cases there was well-marked jaundice; in 17 of these the icteric staining was intense. In all the fatal cases except two there was either complete suppression of urine or the amount was reduced to a few ounces per diem. In the two exceptions a fair secretion of urine was maintained to the end; in both of these cardiac dilatation with pale and flabby muscle was found post mortem. Suppression was often associated with persistent vomiting and intractable hiccough, causing great distress to the patient and rapidly leading to exhaustion. In some cases hypodermic injections of hyoscine (1/100 gr.) combined with morphia (1/6 gr.) were successful in controlling these symptoms when other means had failed.

Treatment.

The most important measures in treatment were found to be warmth and the introduction of large volumes of fluid either by mouth, rectum, subcutaneously, or in exceptional cases intravenously with the object of diluting toxins and maintaining a free flow through the kidneys. The use of Souttar's apparatus was of great value, as by this means continuous rectal administration of saline can be effected, and as much as 5 or 6 pints introduced in the course of 24 hours. The life of one patient, a nurse, under the care of Major Anderson, was undoubtedly saved this way. The general rule in regard to quinine was to withhold it unless there was

evidence of concurrent active malaria. If parasites were present, or the spleen was enlarged and at the same time tender, quinine was given in full doses and with beneficial results.

DYSENTERY.

Next in numerical frequency to malaria, and hardly less important in its consequences, was dysentery. The total number of admissions for the three years was 21,147, representing a ratio per 1000 troops of 64 in 1916, 29 in 1917, and 58 in 1918. The total number of deaths was 414, equivalent to 1·9 per cent. of admissions; or calculated as a ratio per 1000 troops, 1·4 in 1916, 0·6 in 1917, and 0·98 in 1918. The above figures are probably in excess of the actual numbers, especially for the year 1918, as, owing to the importance of early treatment and the impossibility of bacteriological examination in all cases, it was agreed to accept as the basis of diagnosis clinical criteria irrespective of bacteriological proof. This policy was deliberately adopted as affording the maximum of protection to the community, though it doubtless involved a diagnosis of dysentery in a certain number of cases of acute enteritis which were really due to some other cause.

There are, unfortunately, no figures available to show the relative frequency of the amœbic and bacillary forms of the disease. The latter was the dominant form, and though amœbic cases were present throughout, it was only late in the season of 1917 that the extent to which this form prevailed in the command came to be recognised, partly owing to the indefatigable work of a protozoologist who spent his whole time in visiting laboratories, giving his opinion on doubtful specimens, and advising as to methods. Evidence gradually accumulated of the existence of a widespread amœbic infection in its most insidious form, being carried by apparently healthy individuals, with or without a history of previous dysentery, and often suffering from no disability beyond occasional attacks of diarrhœa. The policy with regard to evacuation of dysentery cases became more and more stringent; first all proved cyst carriers were sent home; then all cases who came under observation with a history of repeated attacks of diarrhœa; then all dysentery cases with a history of a previous attack; and, finally (in 1919) all cases of dysentery, amœbic or bacillary, first attacks or otherwise, clinical or bacteriologically proved, were evacuated by hospital ship. These successive measures indicate the importance which came to be attached to the rôle played by carriers in spreading the disease in both amœbic and bacillary forms. It is impossible to say how far these measures might have succeeded in reducing the disease had troops remained in Salonika during 1919 in the same numbers and under similar conditions; with the rapid evacuation of troops after the armistice and the shifting of headquarters to Constantinople the conditions were radically changed; but it is worth noting that the type of dysentery seen in the hospitals in the Caucasus during 1919 was very different from that we had been familiar with in Salonika; the bulk of the cases were mild and of short duration; serious cases were uncommon, and the death-rate for the year was only 0·43 per 1000 troops.

Of equal importance to human carriers, and commonly forming an intermediate link in the chain of infection, came flies. The plague of flies was at its worst at two periods of the year, in the early summer and in the autumn; at both these seasons the heat was accompanied by a relatively high humidity; during the intervening months of great heat with dryness the fly nuisance was largely mitigated. Turning to the dysentery curve, it is seen to present a precisely similar seasonal variation, with an initial outbreak in the spring, reaching its maximum in late June and July, followed by a substantial reduction in the number of cases during August and September, and a recrudescence of disease in the autumn, at its height at the end of October or early in November. (Fig. 3.) This coincidence, obvious on the larger scale, was worked out on a more exact basis for a group of hospitals near Salonika, by Captain J. F. Taylor, R.A.M.C., whose observations go far to incriminate the fly as a carrier of dysentery organisms. Not only did he establish the fact that in these hospitals the incidence of dysentery corresponded exactly to the prevalence of flies as measured by the numbers caught in traps, which were exposed from 11 A.M. to 2 P.M. on each day, but he also showed

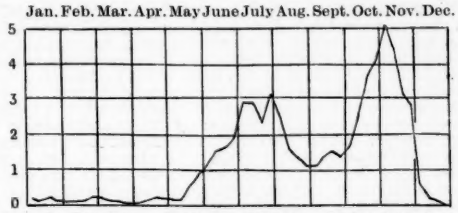

FIG. 3.—*Dysentery.*—Weekly admissions during 1918 shown as ratio per 1000 of strength.

experimentally that the fly is capable of carrying both Flexner and Shiga bacilli; in one instance he recovered from a fly, captured in a hospital kitchen, Shiga bacilli with typical cultural and agglutination characters.

Clinical Features.

As with malaria, so in dysentery, a few cases were seen in which the initial symptoms appeared with such dramatic suddenness, and the intestinal disturbance was of so severe a character, that the possibility of the case being one of cholera could not be dismissed without serious consideration. The possibility of an outbreak of this disease had always to be reckoned with, though fortunately the organisation which had been prepared to meet such a contingency never had to be put to the test. In the cases referred to all the initial symptoms of cholera were present—copious rice-water stools, profuse vomiting of watery fluid, cramps, low blood pressure, and rapid collapse; but an immediate examination of the stools showed an absence of vibrios, and the cases, which ultimately were proved to be dysentery, responded rapidly to intravenous injections of antidysenteric serum combined with hypertonic saline.

Œdema.

Another interesting group of cases was characterised by œdema. This sometimes developed during the acute phase of cases of a severe Shiga infection, in which there appeared to be a rapid flooding of the system with dysentery toxins. In other cases the symptoms appeared at a later stage and in the absence of any of the usual antecedents of œdema. The cardiac condition, though feeble, was not in itself sufficient to cause œdema; the urine was not reduced in quantity, and though containing albumin in varying amounts, it had none of the characters which are usually associated with acute nephritis. The possibility of the condition being due to a food deficiency, and connected with the drastic restrictions in diet which were found essential in the routine treatment of acute dysentery, deserves consideration. A noteworthy feature is that ascites was often a prominent symptom, and out of proportion to the œdema elsewhere; thus in one case ten pints of fluid were removed from the abdomen, and on the following day, when I saw the patient, there was still a large amount of fluid present.

Other cases of special interest were those in which after the cessation of all intestinal symptoms pyrexia continued and the patient rapidly lost ground and became emaciated. The tongue was usually dry, smooth, and shiny. A liberal diet made little or no difference to these patients. They were able to take and digest a considerable amount of semi-solid food without diarrhœa or any symptoms of gastric or intestinal disturbance, but their assimilative powers seemed at fault and they steadily lost weight.

Hæmorrhage and Perforation.

These were both very rare complications. The first event was more common in connexion with the ulceration of long-standing amœbic dysentery than in cases of bacillary origin. In cases of perforation the actual rupture of intestine was almost always preceded by an adhesive peritonitis, which sufficed to prevent a general infection of the peritoneum. The resulting abscess formed slowly and was strictly localised. The whole process was very insidious, and, being marked by no special symptoms either at the time of perforation or during the subsequent stage of pus formation, might easily be overlooked. In one instance of acute Shiga dysentery a generalised acute peritonitis occurred without perforation; except for rather marked meteorism, the features of the case were in no way distinctive, but at the

post-mortem examination general peritonitis was found, with two pints of thin purulent fluid in the abdomen. The intestines were examined with the greatest care, but no perforation was discovered.

Arthritis.

Although arthritis cannot be called a common complication of dysentery, there were during the season always a few cases under treatment, arising more often in complication of Shiga than of Flexner infection. The condition usually appeared in the course of the third week and involved one or more of the larger joints, especially the knee. In the acute stage there was considerable enlargement and tenderness of the joints, with effusion of fluid, and pyrexia of irregular type. The acute stage was followed by a protracted period, during which the fluid was absorbed and some thickening of the periarticular structures took place, giving rise to a condition not unlike that of rheumatoid arthritis, with considerable stiffness and pain on movement. In some cases the course was so prolonged that a permanent disability seemed inevitable, but I remember no case, however protracted, which had not made some progress towards recovery before leaving hospital. In the acute stage rest is necessary, and when the joint was tense with fluid much relief was afforded by tapping and the removal of the fluid. In a few cases treated with antidysenteric serum there was a rapid fall of temperature, with subsidence of joint symptoms. This method of treatment merits further trial, though it should be used with caution in cases that have previously been given serum during the stage of acute dysentery on account of the risk of anaphylaxis. After the acute symptoms have subsided it is a mistake to keep the joint absolutely at rest; massage and carefully regulated passive movements should be employed, and radiant heat is useful. The joint fluid is generally turbid, and in one case of a series of ten examined bacteriologically by Captain R. R. Elworthy, R.A.M.C., a Shiga bacillus was isolated from the fluid and cultivated. In the remainder of the series the fluid was sterile. Dysenteric arthritis is readily distinguished from serum arthritis by the lateness of its onset (usually between the fourteenth and twenty-third days of the disease) and by the comparative severity and long duration of the lesions. An interesting point is the almost constant association with conjunctivitis, which was a useful herald of the advent of arthritis, since it appeared usually about 48 hours, but sometimes several days, in advance of the joint condition.

Nervous Complications.

These were observed in sequel to both amœbic and bacillary forms of dysentery. A man who had just completed a second course of emetine treatment for an attack of amœbic dysentery after three months from the onset of his symptoms developed paresis of the legs. On the next day (July 14th) the knee-jerks, which had been present on the 13th, were unobtainable, and there was weakness of the grasp on both sides. On the 15th there was difficulty in swallowing, breathing was laboured, and the voice was hoarse. Two days later (July 17th) there was complete loss of power in the legs, which were flaccid. Sensation was unimpaired. On the 18th there was anæsthesia on the inner aspect of both legs and knees, there was very little power in the recti muscles, respiration was chiefly intercostal, and the patient was unable to puff out his cheeks. The cerebro-spinal fluid was under slight pressure; its characters were normal. On the 21st there was incontinence of urine and fæces. In the course of the following days breathing became very difficult, the patient was irritable and restless, and on the 25th he died, 12 days after the onset of nervous symptoms. Post mortem the meninges of the brain were congested and the cerebro-spinal fluid was in excess, otherwise there were no macroscopical lesions of the nervous system. The intestines showed evidence of long-standing dysenteric ulceration. Unfortunately no data as to the microscopical lesions were forthcoming. In another case of clinical dysentery, not bacteriologically proved, paresis of both legs and both arms, with loss of deep reflexes, supervened a fortnight after the cessation of intestinal symptoms. The cardiac dullness was increased both to the left and to the right, the breathing became embarrassed, and the patient died of heart failure 19 days after the onset of paresis. Post mortem all the chambers of the heart were dilated, the brain and meninges were congested and œdematous, and marked degenerative changes were found in sections of the popliteal and vagus nerves that had been removed for examination.

Amœbic Hepatitis.

This subject is one that would be more fittingly dealt with by one of my surgical colleagues. Some scope, however, was provided for the exercise of the physician's art, both in diagnosis and treatment, as the diagnosis largely depended on the correct reading of the physical signs produced by an upward displacement of the diaphragm, usually on the right side, with shifting of the heart to the left and collapse of the lower portion of the right lung; also, by prompt emetine treatment the process was often arrested in the pre-suppurative stage.

Brief particulars may be given of two cases with unusual features, the records of which were kindly supplied to me by Major St. J. D. Buxton, R.A.M.C. The first case was of interest owing to the occurrence of general peritonitis, which supervened without obvious cause four weeks before pus was located in the liver and cleared up satisfactorily after operation and the removal of seropurulent fluid from the abdomen. Subsequently a right-sided pleurisy occurred with clear effusion, which became converted into an empyema owing to sloughing of the diaphragm and escape of the contents of the liver abscess into the pleural cavity, as was shown later at the operation. This patient made a good recovery. The second case, a fatal one, was remarkable for the presence of two large abscesses in the right lobe and numerous small abscesses about the size of a pea in both right and left lobes of the liver; one of the two larger abscesses was incised and drained, but was found at the autopsy to have leaked downwards below the colon and cæcum. In view of the multiple foci of suppuration it is clear that no further operative measures could have saved the life of this patient. The association of a clear pleural effusion with pus in the liver was observed in another case, the nature of which was obscure until in the course of the fifth week a large aspirating needle was introduced into the right pulmonary base and six ounces of very thick pus were withdrawn. In the course of operation on the following day clear fluid, through which the aspirating needle must have passed, was found in the pleural cavity; below this was a liver abscess, which was incised and drained.

In the dysenteric wards there were always to be seen the best instances of *combined infections*, with a complex clinical picture, in which it was often difficult to assess the relative importance of the various infective agents. The case may be quoted of a patient admitted to hospital with a proved Flexner infection. As the result of pathological observations initiated on the following day subtertian parasites were found in the blood, *Entamœba histolytica* in the stool, from which Shiga bacilli were also isolated. Three days later he fell a victim to influenza; bronchiolitis supervened and he succumbed. Total, five distinct infections.

Treatment.

Among the many points of interest which might be discussed in connexion with the treatment of dysentery I will make no reference to the important subjects of dieting and the use of salines and will confine my remarks to two points only: (1) the use of serum in bacillary dysentery, and (2) the value of emetine in amœbic cases.

As regards serum treatment we were at a disadvantage in being supplied with a polyvalent serum of whose specific properties we knew very little beyond the fact that in different samples agglutinins against the various types of dysenteric organisms were represented in very varying degrees. The situation was to some extent cleared in 1918 by Colonel Dudgeon, who by his observations on 17 samples of sera showed that many of them were very deficient in agglutinins, especially for *B. Shiga*, which were precisely the ones for which we had the greatest need, as the Shiga bacillus was undoubtedly the organism responsible for the bulk of the more serious cases of acute dysentery. If it had been practicable to supply us with pure anti-Shiga and anti-Flexner sera more striking results would doubtless have been obtained. Even as it was, working with sera of undefined therapeutic properties, a favourable impression on the whole was formed of the value of serum treatment, given two conditions—(1) that the serum was administered at the earliest possible moment, and (2) that sufficiently large doses were used. The tendency with serum in dysentery, as with quinine in malaria, was to give increasingly large doses as our experience grew, and latterly amounts of 80 to 100 c.cm. were given subcutaneously in all cases with the clinical features of an acute bacillary dysentery immediately on admission, without waiting for a bacteriological report. The dose was usually repeated on the following day, and again on each of the succeeding two or three days, in the same or reduced amount, according to the course taken by the disease. In cases of special severity serum was given intravenously in combination, if necessary, with normal saline or isotonic glucose solution. The value of intravenous saline was very great in dehydration cases with copious watery stools, a condition in which the maintenance of the body fluids is of the utmost importance. The prospective benefit of serum treatment in any given case rapidly lessens with the lapse of time from the onset of symptoms, and the opinion was formed that nothing is to be gained by the inauguration of serum treatment later than the sixth or seventh day of the disease. Serum rashes and transient joint symptoms were not uncommon; these were sometimes accompanied by severe febrile reaction; true

anaphylaxis was, fortunately, very rare. A valuable article on the diagnosis and treatment of dysentery in the British Salonika Force was read by Lieutenant-Colonel Duncan Graham, C.A.M.C., at a meeting of the Salonika Medical Society in May, 1917, and published later in THE LANCET of Jan. 12th, 1918. In the light of subsequent experience it is interesting to note his opinion, expressed at that time, that less than 3 per cent. of the dysentery in the Salonika area was of the amœbic type.

In the treatment of amœbic cases emetine was of the greatest value in controlling acute symptoms and causing the disappearance, at least for a time, of cysts and amœbæ from the stools. But in a large proportion of cases the benefit was temporary, and periodical examination of the stools sooner or later disclosed the reappearance of organisms, though the accompanying intestinal disturbance might be of very slight severity, amounting only to looseness of the bowels, with or without the presence of mucus in the stools. From figures supplied to me by Captain C. W. Budden, R.A.M.C., who was in charge of the special section at the convalescent depôt to which dysentery cases were discharged, it appeared that of all dysentery relapses, 65 per cent. were in amœbic cases, and that of all amœbic cases which came under his care 75 per cent. never became sufficiently fit to return to duty. It cannot be said that these patients had not received adequate emetine treatment; in every refractory case at least two, and sometimes more than two, full courses of emetine were given, though it was eventually realised that if a patient was not cured by a second course it was waste of time to give further treatment in Salonika, and that the only prudent course was to evacuate him from the command as soon as possible. The value of emetine in acute dysentery was very similar to that of quinine in malaria—that is to say, of the greatest use in controlling the acute manifestations of the infection, but disappointing when used for the purpose of eradicating the parasites from the system. A course of emetine lasted for 12 days, during which the patient either received ⅜ gr. hypodermically twice daily, or 1 gr. hypodermically, plus ½ gr. by the mouth daily, or 3 gr. of bismuth-emetine-iodide by mouth, either alone or in combination with hypodermic treatment. From statistics in No. 15 of the Special Report Series of the Medical Research Committee it appears that emetine treatment meets with a greater measure of success here in England than was the case with us. This is no more than one would expect, and justifies our policy of the early evacuation of cases which did not rapidly clear up.

The criterion adopted for the discharge of bacillary cases from both hospitals and convalescent depôts was a purely clinical one; after a week on full diet and in the absence of intestinal symptoms the patient was regarded as fit to leave hospital, and similarly if there was no recurrence of symptoms during his stay at the convalescent depôt, and his general health was good, at the end of three weeks he was passed as fit for duty without bacteriological examination. Special importance was attached to the presence of mucus in the stools as evidence that the dysenteric process had not completely subsided.

ENTERIC GROUP.

Of the enteric group I have very little to say. The troops were well protected and the incidence was small. Fig. 4 shows the incidence of all forms grouped together for the three years 1916–18. It is seen that there is a marked drop from 11·77 per 1000 troops in 1916 to 0·84 per 1000 in 1918. In Fig. 5 is shown an analysis into the various members of the group for each of the three years. I cannot explain the large number diagnosed as "enterica, clinical" during 1916; it is out of proportion not only to the pathologically proved cases in the same year, but also to the number of "clinical cases" in the following years. Of cases pathologically proved it is seen that most were paratyphoid, para. A being in excess of para. B, specially in the two later years. The disease with few exceptions was of a mild type, and only 65 deaths occurred during the whole period. The case-mortality in 1916 was 3·62 per cent.; in 1917, 3·78 per cent.; and in 1918, 4·44 per cent. The majority of severe cases were due to *B. typhosus*, a large proportion of these being admitted to hospital from vessels arriving at the port.

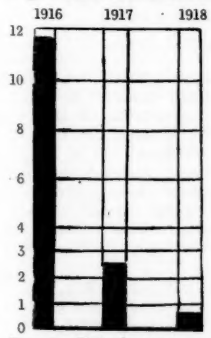

FIG. 4.—*Enteric group.*—Showing incidence of all forms as a ratio per 1000 troops.

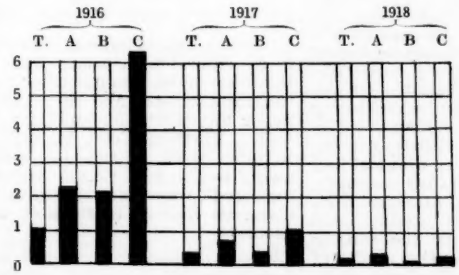

FIG. 5.—*Enteric group.*—Showing relative incidence of different varieties. T., typhosus; A, para A; B, para B; C, clinical.

INFLUENZA.

The outbreak of influenza with its attendant complications took a heavy toll of the forces, and was the cause of special anxiety owing to the fact that the height of the epidemic corresponded to the military operations in September, 1918, which led to the defeat of the Bulgars and the signing of the armistice with Bulgaria. The total admissions for influenza and pneumonia during 1918 were 17,813, being at the rate of 111·33 per 1000 troops, and the total number of deaths was 1387, or 8·67 per 1000; that is to say, almost 1 man out of every 100 troops fell a victim to the disease. The mortality was greatest during the five and a half weeks from Sept. 22nd to Oct. 30th, when deaths were occurring at the rate of 112 per week.

The epidemic first made its appearance in June in an outlying prisoner-of-war camp near Ekaterini, where there was an extensive outbreak of more than 800 cases, nearly all of mild type. By the end of June cases of what had come to be described as the "prevailing epidemic," many of them with serious pulmonary symptoms, were common in the Janes district, and as at the same time and in the same area there was an outbreak of sandfly fever, and every day showed a rising rate of admissions for malaria, the differentiation of these diseases was often difficult, and a certain degree of confusion in diagnosis was inevitable. At the end of August there was a serious outbreak of disease among Indian troops and Turkish prisoners of war at two adjacent camps at Arakli Farm, near Llangaza Lake; some of these were cases of malaria, but in the majority the illness differed from malaria in the sudden onset without rigor or shivering, the absence of enlarged spleen or splenic tenderness, and the presence of a respiratory tract catarrh. Of the malaria cases in this outbreak there was a great preponderance of M.T. infection, as proved by examination of blood films. Another serious outbreak occurred a week or two later in a battalion 590 strong on the Doiran front; of these, 130 fell ill, chiefly from two companies, in the course of three days; the infection spread rapidly, and in a couple of weeks the whole battalion was, in the words of the medical officer, "almost burnt out." In the earlier stage of the influenza epidemic attempts were made by segregation of the sick to prevent its spread, but these proved unavailing, and the disease rapidly became practically general through the command.

Clinical Features.

The clinical features of the epidemic in Macedonia do not appear to be essentially different from those of the epidemics at home and on the Western front, and I have little to add to the full and vivid account given by Major J. Burnford, R.A.M.C., in a communication to the Medical Section of this Society on April 29th, 1919.

The disease usually began as an intense tracheitis spreading to the bronchial tubes, and in the more severe cases rapidly involving the finest elements of the bronchial tree

with a patchy consolidation of lobular type. A true lobar pneumonia was comparatively uncommon, but frequently so many lobules were involved that the condition became confluent and the physical signs were indistinguishable from those of a lobar consolidation. Pleurisy and empyema were common complications. Other grave complications were necrosis of the lung leading to multiple abscesses, pericarditis, and meningitis. In one case next to no normal lung tissue was left; the lower lobes, middle lobe, and central part of the upper lobes were in a state of necrotic disintegration, crumbling under the finger, and readily separated from the pleura and the connective framework of the lung. The remainder of the upper lobes was emphysematous, some of the bullæ being of the size of a Tangerine orange.

The course of the disease was sometimes very rapid. In the case of a V.A.D. a state of generalised bronchiolitis was developed within a few hours, causing intense dyspnœa and cyanosis, with fine bubbling râles audible over the whole surface of the chest. Death took place within 24 hours of the onset. A common feature was the abundance of thick purulent sputum, sometimes streaked with bright red blood. This was difficult to expectorate, and its accumulation in the bronchial tubes led to marked dullness on percussion and complete abolition of breath sounds over the affected part. Voice vibration was diminished or absent, and in some cases these "silent" lungs could hardly be distinguished from pleural effusion except by the exploring needle. In some cases there was a rapid poisoning of the cardiac mechanism by toxins, and death was due to heart failure; in others there was prolonged resistance, the pulse remaining good till near the end, death apparently being due to the mechanical effects of a prolonged blocking of the bronchial tubes. Little could be done for the relief of this condition, which was most distressing, the patient literally fighting for breath and life over a period of many days. An interesting group of cases was that in which the temperature came down by lysis, and there ensued a long apyrexic period, during which the patient steadily lost ground and ultimately succumbed. In other cases sudden death occurred from cardiac failure after the fall of temperature and when the patient was apparently progressing towards a satisfactory convalescence. Cases were, unfortunately, common in which influenzal pneumonia was complicated by an acute attack of malaria, a combination which usually proved fatal.

I cannot leave this part of my subject without paying a tribute to the devotion and utter disregard of personal risk displayed by the nursing staff on duty in the wards reserved for serious cases during this epidemic. The work in these wards was extremely heavy, and the risk of catching a disease which might prove fatal was a very real one; but they did not spare themselves and the nursing of the sick throughout the emergency was worthy of the best traditions of the profession.

SANDFLY FEVER, &C.

Outbreaks of sandfly fever occurred at various places during the hot seasons, specially at Janes and at Chanak, and on more than one occasion the routine work of a medical unit was carried out only with great difficulty owing to the rapidity with which one member after another of the community fell a victim to the disease. Distinguishing points from malaria, apart from the blood examination, were the conjunctival injection with pain behind the eyes, the severe character of the pains in back and limbs, and the fact that with an equal degree of pyrexia the patient was not so much under the weight of his illness as during the actual attack of malaria. Initial rigors were rare, and the temperature curve, with its maximum on the first day and its gradual fall during the two following days, was unlike that of any type of malaria. The subjective feelings of the patient were different in the two diseases; a patient with sandfly fever who had had previous experience of malaria was always emphatic that his present illness was something different from malaria. The presence or absence of sandfly bites gave no help, as it was common during the sandfly season for patients with malaria to bear the marks of previous bites; on the other hand, sandfly fever might occur without any marks on the skin or any knowledge on the part of the patient that he had been bitten.

Sporadic cases of *acute meningitis* were seen from time to time, the majority being due to the meningococcus, while others were in connexion with the influenza epidemic. In one case of meningitis involving both brain and spinal cord films and cultures from the meninges showed a Gram-positive coccus; cultures from the heart's blood obtained post mortem also showed a Gram-positive coccus which was morphologically identical with *Staphylococcus aureus*.

In 1917 a *neurological section* was started at one of the general hospitals, in which invaluable work was done by Captain T. Graham Brown and Captain R. M. Stewart, R.A.M.C., who were in charge of the department. As I understand it is their intention to publish a full account of the work of the department, I will make no further reference to it here.

TREATMENT OF PRISONERS IN BULGARIAN HOSPITALS.

Shortly after the armistice I made two expeditions to Bulgaria, as far as Sophia, and from there to Pirot, just beyond the Serbian frontier. In the Bulgarian hospitals at Sophia there were a few of our men who had been taken prisoners of war and were being treated for wounds or sickness. None of them were seriously ill, and in conversation they all expressed themselves as satisfied with the way in which they were being looked after; they were evidently receiving the same attention as the Bulgarian patients, and so far as could be seen the Bulgarian doctors were well trained and skilful, though much handicapped through shortness of medical supplies and appliances. There was also great scarcity of provisions, and our men found it necessary to supplement their scanty rations by buying bread, as far as their resources permitted, at the exorbitant prices which were ruling in the town. One of the hospitals was equipped with a complete set of Zander apparatus, a gift from the German Red Cross at the beginning of the war; when the Bulgarian collapse was imminent and the Germans left Sophia they wanted to take this costly apparatus away with them, and had to be reminded by the Bulgars that it was a gift, not a loan.

Very different was the treatment of Serbian prisoners-of-war patients by the Bulgars. At Radomir, an hour's run from Sophia to the west, was a concentration camp for prisoners of war, and attached to this was a so-called hospital. The dysentery ward was crowded with patients lying on filthy mattresses on the floor, two or three to each mattress; these patients were mostly suffering from acute dysentery, and were supplied with no conveniences and no attention beyond what they could give one another. A Bulgar doctor was supposed to see them daily, but I was told that before the arrival of the British he seldom visited this ward and the only regular attention they received was a morning visit from orderlies to look round and remove the bodies of those who had died during the previous 24 hours. As I was leaving the ward one of the inmates in a far corner called out to me in English; he was one of our men who by some mischance had got mixed up with the Serbian patients; it was not many hours before he was being cared for in a section of a F.A. that had recently arrived at Radomir, to his unspeakable relief. He was suffering from a severe attack of dysentery, but when I last heard of him he was doing well. Thanks largely to the energy of Colonel J. Ward, D.S.O., backed by the Bulgarian D.M.S., who gave what help he could, hospitals for sick and wounded Serbs were rapidly organised and staffed by our R.A.M.C. at Sofia, Radomir, and later at Pirot, where Serbs once more after long disuse were able to enjoy the advantages of good treatment and careful nursing.

TYPHUS AND RELAPSING FEVER.

A few cases of typhus and relapsing fever occurred in the Macedonian area. Both these diseases became relatively more common after the movement of troops to Constantinople and the Caucasus, though there was never anything approaching an outbreak on a large scale. The Weil-Felix reaction was of value, specially in mild cases, though its usefulness was restricted owing to the fact that a positive result could not be expected earlier than the fifth day, by which time the diagnosis had in most cases become clear on other grounds.

From investigations made by Captain J. Warnock, R.A.M.C., it appeared that the rise in the agglutinating power of the serum was very rapid, and in the course of 24 hours there might be an increase from 1/25 or 1/50 to 1/100, which was taken as the standard for a positive result. This standard was reached on the fifth day, sometimes earlier, and was followed by a rapid rise in agglutinating power, until at the end of the pyrexial period (tenth to fourteenth day) a reaction was obtained with a very high dilution—e.g., 1 in 3000, 1 in 8000, and in one case 1 in 32,000. The subsidence of fever was followed by a rapid fall in the reaction. Control observations were made in cases of relapsing fever, cerebro-spinal fever, small-pox, typhoid fever, malaria, influenza,

pneumonia, syphilis, and in normal individuals with negative results.

As an example of the utility of the reaction a case may be quoted in which marked meningeal symptoms were present at the onset; as a result of lumbar puncture a few drops of semi-gelatinous mucoid material were obtained containing scanty lymphocytes and no micro-organisms; the Weil-Felix reaction was positive on the seventh day with a dilution of 1 in 100; on the tenth day it was marked at 1 in 1600, and slight at 1 in 3200.

In the state of profound toxæmia, which characterised the severer forms of typhus, benefit was derived from repeated intravenous salines. In the case of a patient at Tiflis who was desperately ill, in a semi-delirious state with low temperature and irregular pulse almost imperceptible at the wrist, and dry, thickly-coated tongue which could hardly be protruded, this procedure seemed to be the turning point of the illness, and when seen a week later he was convalescent. Among the complications and sequelæ of typhus observed in our own units and in Russian hospitals, I may mention suppurative parotitis, otitis media with mastoid disease, bronchitis and broncho-pneumonia, femoral thrombosis, and hemiplegia. In one case a complete unilateral paralysis of head, arm, and leg developed gradually in the course of three days during convalescence.

VISITS TO CIVILIAN AND MILITARY HOSPITALS IN RUSSIA.

While travelling in the Caucasus and Southern Russia in the summer of 1919 I had opportunities of visiting hospitals, both civilian and military, other than our British ones. At Batoum I visited the general hospital for the province and the infectious hospital for the town, both civilian hospitals, but under different management.

The first was fairly well run on very limited resources; they were short of drugs and all kinds of medical appliances, but the hospital was clean and they were making the best of a difficult situation. The cases were chiefly relapsing fever and convalescent typhus. The town hospital was a contrast in every way: the wards were crowded and filthy, the bedclothes were grimy; flies were everywhere, and the atmosphere on a hot afternoon with closed windows can be better imagined than described; outside one of the wards was a cesspool overflowing into the hospital grounds.

At Tiflis Colonel Wenyon and I were taken over the Georgian Municipal Hospital, a fine building in extensive grounds, with clean and well-arranged wards and adequate laboratories. The methods here were up-to-date and the standard of clinical work was high. The clinical material was excellent and we spent a long morning in the wards, seeing many interesting cases. From Tiflis we went up to Erivan to investigate the circumstances of a case of suspected cholera among our troops, and were shown round one of the military hospitals by an Armenian doctor. The chief clinical interest was in the wards where cases of "typhus recurrens," or relapsing fever, were under treatment. Of the numerous charts shown to us there were only one or two with more than a single relapse, notwithstanding the fact that no arsenical preparation was used in treatment. When asked why he did not give salvarsan, the doctor replied that it was unnecessary, as the cases were mild and invariably recovered without special treatment; he said he had never had a death from the disease, but I think the chief reason for withholding salvarsan was the fact that he had none to give. At many of the other hospitals I made the same inquiry and received a similar answer; it was clearly the local view that relapsing fever was a comparatively mild disease, and that deaths were very rare.

Lice in the Hospitals.

From Batoum I went north to Novarossisk and Ekaterinodar, which at the time was General Denikin's headquarters. At both these places in early June the prevailing disease was relapsing fever; there were also many cases of typhus in the hospitals, but the majority were in the convalescent stage. At Ekaterinodar some of the hospitals were well arranged, others were the reverse; a reproach common to all was the failure to keep the patients free from lice. The part played by lice in the spread of disease was well known, but when it came to practical measures there was a lamentable failure in the application of their knowledge. Real difficulties were present in the shortage of change of clothing and bedding, shortage of nurses, and sometimes shortage of water. The first of these was being remedied as far as possible by grants of linen from the British Military Mission, but little or no attempt was made to grapple with the louse problem, with the result that large numbers of the medical and nursing personnel fell victims to typhus. An incidence of 30 to 50 per cent. was regarded as a normal state of things; at one hospital in a vodka factory, with beds almost touching in unventilated and stuffy wards, *all* the personnel had had typhus, a record of which they were proud, instead of regarding it as a mark of the inadequacy of their hygienic service. It is a curious illustration of the mentality of the Russian authorities that, while neglecting such obvious precautions, they were ready to experiment with unproved and speculative methods of prevention and treatment. At Ekaterinodar some of the personnel in typhus wards were being inoculated with what was described as a "vaccine" consisting of sterilised blood drawn from typhus patients at the date of the appearance of the rash. Good results were claimed for this procedure. Also cases of typhus were being treated with serum removed from convalescent patients three to five days after the temperature had become normal. A daily dose of 10 c.cm. was given subcutaneously for three to four days. The account of the benefits derived from this method of treatment was not convincing, and hardly justified the removal of large quantities of blood from those who were recovering from a grave and debilitating illness. At Novarossisk intravenous injections of cyanide of mercury, in doses varying from 0·001 to 0·01 g., were given in 2 c.cm. of water every second day; 300 to 400 cases of typhus had been treated in this way with alleged good results.

The hospitals at Constantinople were, on the whole, clean and well ordered in most respects, except in their nursing arrangements, which were far below the standard which we regard as essential. Everywhere there was a shortage of drugs and medical and surgical necessaries, and all schemes for improvements and developments were held up for want of funds. The children's hospital on the outskirts of the town was a model of its kind, consisting of a number of separate pavilions standing well apart from one another in wooded park-like grounds overlooking the Bosphorus.

I cannot conclude my remarks without paying a special tribute to the D.M.S., Major-General Sir M. P. Holt, K.C.B., K.C.M.G., who was always ready with his advice and whole-hearted support in carrying into effect any recommendations made with the object of improving the details of the medical service, and whose unfailing interest in the clinical aspects of the work was of immense encouragement to all concerned in maintaining a high standard of clinical efficiency. I also wish to express my thanks to Colonel C. B. Martin, C.M.G., Brevet Lieutenant-Colonel J. A. Anderson, and Major W. R. Galwey, O.B.E., M.C., for supplying me with the figures and curves on which the foregoing statistical diagrams are constructed; to my predecessor, Sir J. Purves Stewart, K.C.M.G., C.B., for many kindnesses; to Major H. W. Wiltshire, O.B.E., D.S.O., and Major H. R. Evans, for valuable criticism and suggestions, and to officers-in-charge of medical divisions, and medical officers of the various hospitals, on whose willing coöperation in showing and discussing cases of interest so much depended in collecting the data on which this communication is based.

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THE PHYSICAL ELEMENT IN THE PSYCHO-NEUROSES.*

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ARTICLES and discussions on the pathology of the war neuroses show an increasing tendency to regard mental factors as of much greater importance than bodily, and to look to psychotherapy as the only certain remedy, leading often to a dramatic cure in a time varying from a few minutes to a few hours; it is unusual to find reports of cases which the author has found difficult or impossible to cure.

No one would deny the importance of psychical factors in nearly every disease. Even in such serious conditions as cancer or pneumonia we recognise the beneficial effects of cheerful words of encouragement. The beginnings of disease of the nervous system are frequently associated with, and overshadowed by, hysterical manifestations which may be removed by suitable explanation and persuasion. It is an interesting speculation whether an emotional shock would abolish for a time the severest suffering. For example, if the wife or the child of a man in the agony of angina pectoris or of a paroxysm of trigeminal neuralgia was killed before his eyes, would his pain suddenly vanish and for how long?

But in addition to the beneficial effects of psychical influences on disease, there is evidence that emotional disturbance is an important ætiological factor in maladies other than the neuroses. The symptoms of chorea or of paralysis agitans may begin to develop immediately, or soon after, some severe emotional shock. No doubt in many such cases pathological changes are already present in the nervous system, but there may be no clinical indications of the presence of such changes, the patient appearing to be quite well before the emotional shock. Jaundice is sometimes precipitated by fright, which shows the effect of shock on glandular organs. Some time ago, Sir Thomas Barlow told me of a boy, aged 10, previously well, who was all but run over, just getting on to the kerbstone of the path. That night he became very pale and within a fortnight died with all the characteristic signs of acute pernicious anæmia. These examples indicate that emotional disturbance may initiate serious and even rapidly fatal disease.

Frequency of Relapse in Discharged Neurotics.

Passing now to my experience of the neuroses, I have been much impressed by the frequency with which relapses have occurred in cases which had been discharged from Maghull, Seale Hayne, and other neurological hospitals, as either cured or improved. At the Brinnington Hospital Dr. R. L. Gamlen (the medical superintendent) and I have records of a large number. What is the explanation? What is the pathology of the cases which so easily relapse? A common type of case which tends to relapse often more than once may be outlined as follows:—

A strong young man, never ill before enlistment, is exposed to some nerve-racking incident at the Front, from which he never seems to recover completely. He is admitted to a neurological hospital suffering from extreme nervousness: his limbs shake and his sleep is much disturbed by horrible dreams. After suitable treatment, psychical and other, followed by occupation in the garden or in one of the workshops at the hospital, he gradually improves, and in a few weeks is discharged as either cured or nearly well. He tries light work, but after a week or two has to give it up, owing either to a sudden collapse or to a gradual return of his weakness and tremor. He has now lost his war-dreams and sleeps fairly well. He may be sent again to a neurological hospital where a further attempt is made to discover any mental complex which may account for his condition. Nothing abnormal is discovered; he improves, is discharged, and sooner or later breaks down again.

The inevitable conclusion appears to be the presence of some indefinable physical disorder; in some way or other his neurones or other parts of his bodily machinery must be out of gear. But whatever the pathology, it is clear that the removal of tremor, rigidity, or other similar symptom does not cure the patient. His unstable condition may last for years, and we cannot use the term "cure" until the man is able to do his ordinary work with as little inconvenience as he felt before the war.

A Typical Case of a Severe Type.

The following case is an example of a more severe and less common type:—

The patient, aged 35, has been in Brinnington Hospital several months. He was blown up owing to the explosion of a shell in August, 1916, and soon after regaining consciousness began to suffer from severe pains in the head, back, and legs. Then he began to shake, and owing to this symptom and the pains he became unable to walk, and has never walked properly since. On admission to Brinnington, he was a typical rigid tremulous case. His extended legs were like iron bars, and his feet and toes were rigidly plantar flexed. At first the greatest force was required to bend his ankles, knees, and hips, and any movement brought on violent shaking of the limbs. By devoting three or four hours a week to him I have got the knees and hips a little looser, and with a great effort he can now draw up the legs in bed, but it is impossible for him to do this slowly; the movement is a sudden jerky one, and can only be performed by the most concentrated effort. He cannot abduct or adduct the limbs or lift his heels from the bed. If I hold up his heel, his leg being either rigidly extended or passively flexed, and slowly withdraw the support of my hand, telling him to keep the limb suspended, his greatest effort is unavailing; the leg jerks down suddenly on to the bed. When encouraged and subjected to firm pressure on the plantar surface of the toes he can slowly dorsi-flex the foot to a very slight extent; this is a great struggle, and is accompanied by a drawing up of the patella and a rigidity of the calf muscles; in fact, all his energy goes to the contraction of muscles antagonistic to the movement. When told to concentrate his mind on the muscles on the front of his leg, with the explanation that these are the muscles which bend the ankles, he says he feels as if he has nothing to pull at. Inability to move part of the limb is not, however, entirely due to contraction of muscles antagonistic to the movement. After the ankle, knee, and hip are forcibly bent, the calf muscles may become quite flaccid, but he is unable to relax the flexors of the limb; for example, he can maintain forced dorsi-flexion of the foot for any length of time, but cannot bend down the foot and toes without a sudden extension of the whole limb.

Arthur Hurst, Yealland, and other advocates of intensive and continuous treatment, would say that the treatment—suggestion, persuasion, and re-education of the muscles—instead of being limited to one or two hours on odd days, should have been carried on without intermission until the rigidity was overcome, however long that might take. The psycho-analysts would say there is probably some mental complex, the unravelling of which would quickly cure the patient. The reply to these criticisms is that the man came to us from Maghull, where for six months he had been treated by the fatigue method, by psycho-analysis, and by hypnotism. He states that he was hypnotised seven or eight times and that when recovering from the hypnotic state he was told to get up and walk, but was unable to do so. When he left Maghull, his condition was much as it is at the present time.

The prominent feature of the case is failure to innervate the muscles of the legs properly, and we may ask: Is this failure due simply to an altered mental state, or are there actual physical changes in some part of his nervous system?

As to the psychical condition, let me repeat that the case was thoroughly investigated and treated at Maghull, and that having had many talks with the man I am unable to suspect a mental complex. I am also convinced that he is very keen to try anything that will lead to his recovery. It is difficult to avoid the conclusion that there are some physical or chemical changes affecting his motor neurones and interfering in the normal relation between impulse and inhibition, changes which in all probability were set up by the effects of the emotional shock caused by the shell explosion. The observed faulty innervation gives one the impression that there is a block at some synapsis which prevents the proper transmission of cortical impulses to the lower motor neurones.

In some respects the patient's inability to relax or inhibit the innervation of his leg muscles reminds one of the phenomenon described by Kinnier Wilson[1] and Walshe in their article on "Tonic Innervation." They give a detailed account of three cases of cerebral lesion, in which the most striking clinical feature was the patient's inability to relax a given innervation in one or other muscle group. Thus in one case, if an object was grasped by the affected hand the patient was

* The main portion of this communication was given at a meeting of the Association of Physicians in Manchester on May 21st, 1920.

unable to relax the grip for a full minute or more, although he made powerful associated movements with the normal arm, and although the tendons of the antagonistic group of muscles could be seen to tighten. The lesion in each case was in the part of the frontal lobe adjacent to the ascending frontal convolution and was associated with slight but definite involvement of the cortico-spinal path, and with slight spasticity of the affected limbs. The greater the involvement of the pyramidal tract the less marked was the tonic innervation. Two of the cases were cerebral tumour, and after operation the tonic innervation disappeared with the development of a post-operative hemiplegia.

The authors suggest that the symptom is associated with diminution of function of cortico-spinal neurones probably owing to interference with the stimuli reaching them by paths from the psycho-motor area of the frontal lobe. They doubt whether the symptom ever occurs when the cortico-spinal system is intact, but they mention a case of Van Vleuten, which suggests that the specific functions of the pyramidal system may have been normal when the symptom of tonic innervation was first noted. In my case, therefore, it seems possible that although a definite organic lesion can be excluded, there may be a break between the cortical neurones which convey stimuli to the motor centres and the neurones which constitute the cortico-spinal paths.

The Physical Basis.

But in considering the pathology of muscular rigidity, we must not restrict our attention to the pyramidal system. We have been too apt to think of this as the only path by which motor impulses reach the lower neurones, in spite of the suggestion made long ago by Hughlings Jackson that in health the whole of the muscles of the body are doubly innervated both by the cerebrum and the cerebellum, a suggestion verified by Sherrington in animal experiments. We now recognise that motor impulses are transmitted not only from the cortex along pyramidal fibres, but also from other parts of the brain along extra-pyramidal tracts.

The tremor and rigidity of paralysis agitans, and of certain lesions of the mid-brain (Gordon Holmes[2]) and the corpus striatum (Kinnier Wilson[3]) are now attributed to lesions of one or other of these tracts. Thus there are many different ways in which impulses from the periphery may reflexly influence the lower motor neurones—the final common path, as Sherrington calls it, along "which all impulses, no matter whence they come, must travel if they are to act on the muscle fibres to which it leads. Reflexes originated at different distant points and passing through paths widely separate in the brain converge to the same motor mechanism—the final common path—and act harmoniously upon it." It is impossible to speak more definitely as to the situation of the lesion which leads to muscular rigidity, or indeed to the other symptoms of the neuroses, nor have we accurate knowledge regarding the nature of the lesion. This might be a disturbance of structure, as, for example, an inaccurate association of some of the neurones constituting either the pyramidal system or one of the extra-pyramidal paths, possibly due to interference with the normal rates of recovery at various synaptic regions, or to a disturbance of the chemical reactions of the blood and lymph which come into contact with the neurones.

The Biochemical Aspect.

The chemical aspect of the problem and the influence of the sympathetic nervous system are full of interest. The researches of Cannon and others have shown that emotions such as fear and anger are attended by disturbances in deep-lying organs, including a discharge of an increased quantity of adrenalin into the circulation; the adrenalin raises the blood pressure and transforms the glycogen in the liver into sugar. If these energising substances are not worked off by muscular action, it is conceivable that their presence in excess in the blood may lead to pathological effects, to a disordered action of both mind and body which later is expressed by tremors, by tachycardia, by starting at the slightest noise, and by terrifying dreams.

In some cases the continued over-action of the suprarenal and thyroid glands may produce a clinical picture similar to that of Graves's disease. Sometimes sugar is present in the urine, and there is ample evidence that emotional states are frequently attended by an increase of sugar in the blood.†

A vicious circle is established; the emotion produces disturbances in the viscera and glands, and these disturbances react on the emotional states, setting up a constant mental unrest. An important paper by Orr[4] and Rows on the Interdependence of the Sympathetic and Central Nervous Systems throws additional light on this subject. They bring forward evidence to show that the situation of certain organic spinal-cord lesions is determined by disturbance of the sympathetic system, and they suggest that "certain so-called functional disturbances of the central nervous system may owe their origin, or if not that, their tendency to recurrence and permanency to the same mechanism." They quote von Monakow, who, while ascribing great importance to the psychogenetic factor in the neuroses, lays great stress upon the bio-chemical factor. Also Lugaro, who says: the "unconscious" is not necessarily that of the psycho-analyst, psychic unconsciousness; it is conceivably the result of chemical phenomena as unconscious and apsychic as any other.

Factitious Erythema.

As having some bearing on the influence of the sympathetic nervous system I would mention dermography or factitious erythema, a symptom about which I have made numerous observations during the last 18 months. If a blunt instrument—say the end of a Yale latch-key—is drawn firmly over the skin of the front of the chest, or in the interscapular region the pallor produced by the pressure is immediately followed by red at its margins; in a few seconds the redness invades the pallid streak and becomes diffuse with blotchy edges; then the flush begins to fade and a central red line is left which has sharply defined margins, sometimes bordered by an area of pallor. The total duration of this phenomenon in health varies from three to five minutes. The erythema reaches its maximum development in Graves's disease, in some cases of which it develops into actual urticaria. Its minimum development is seen in adynamic conditions, as in the final stage of a fatal pneumonia, where only the faintish purplish streak can be elicited. Between these two extremes every variety in rate of development, in intensity and duration, may be observed in different diseases. Its mechanism is obscure; obviously the result of reflex action, it is probably an axone reflex—i.e., it does not involve a nerve centre, merely running up one limb of a bifurcating nerve fibre and down the other. But whatever its mechanism, variations in the tâche must be related to variations in the reactions of the sympathetic nerves, which innervate the peripheral vessels, and to changes in the secretions from some of the ductless glands.

It has been of great interest to me to note that factitious erythema is very pronounced, not only in the "anxiety neuroses," but also in some cases of "conversion hysteria"; thus in two cases of hysterical contracture of the foot, the tâche which was marked, lasted from 45 to 60 minutes. This surely indicates a general as well as a local change—in other words, that true hysteria is not wholly represented by a paralysis, an anæsthesia, or other local manifestation, as is stated by Babinski and Hurst.

I have never felt satisfied with their definition of hysteria as a condition in which symptoms are present which have resulted from suggestion, and are curable by psychotherapy. My observations on hysterical anæsthesia, especially in children, have prejudiced me against such a limited view, and I would refer to a paper on hysterical analgesia in children written by Sir Thomas Barlow[5] nearly 40 years ago. The children varied in age from 2½ to 11½ years. Sensation had not previously been tested, and Barlow took every precaution in the testing. He found that in addition to

† See an article on Hyperclycæmia in Mental Disorders, by F. H. Kooy, Brain, vol. xlii., part iii., p. 214.

the limb or limbs in which analgesia was so profound that strong faradism did not make the child wince, some other parts of the body showed a lack of ordinary response. It is difficult to believe that in such cases there can be the elements of expectant attention or of auto- or hetero-suggestion. It is easier to believe that in the state called hysteria there is a general alteration of the nervous system, and in some of the shock cases either a blood or a secretory gland change.

Conclusion.

In conclusion, the above remarks are meant to apply only to genuine cases of the neuroses. The difficulty in discriminating between malingering and a true neurosis is very great, and, as Buzzard[6] says in his remarks on the diagnosis, we are very apt to be biased by our personal feeling towards the patient. He gives an amusing instance of this: a patient suffering from mutism was such a nice fellow that no one would call him anything but a case of hysteria, but his only successful attempt to speak was when he blurted out that he would rather be dumb for the rest of his life than go back to the front. True malingering—that is, conscious simulation—is rare. It is, however, often combined with true hysteria, or unconscious simulation, and it is such combinations that I think lend themselves most readily to dramatic cures.

I have dealt with the underlying physical basis of the neuroses, because there seems to be a tendency to lay undue stress on the psychical factor. At any rate, it seems likely that molecular disturbances of the nervous system and altered blood states largely account for the *long duration* of many cases and for the *great tendency for symptoms to relapse* on the slightest provocation, whether that be undue exertion, loud sudden noises, or family or business anxieties.

In the most common type of case I believe that better results will be attained by fresh air, sunlight, cheerful surroundings, and light work, than by continuous searching for a hidden mental conflict. Of the value of psycho-analysis in certain intractable cases where there are reasons for suspecting a repressed memory or complex, I am not competent to express an opinion. Nor am I tempted to undertake the necessary investigations when I read that a three years' study of the subject is essential, and that to unravel a complex, to trace some of its elements back, possibly to some incident in childhood, often a very muddy one, may occupy the constant attention of the psycho-analyst for at least several months, and sometimes for a year and even longer.

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THE INFLUENCE OF SUGGESTION ON BODY TEMPERATURE.

BY J. A. HADFIELD, M.A. OXON., M.B., CH.B. EDIN.

MORE than two years ago I published in this journal[1] a paper describing experiments in which blisters were produced by hypnotic suggestion. Since that time I have made the same attempt in perhaps half a dozen cases without success. But I have recently had under observation another case of the same kind in which a blister was formed even more rapidly than in my previous case. I do not propose to describe this experiment, for it was not dissimilar to the last. This case, however, showed a very remarkable susceptibility to suggestions of heat and cold, which was not purely subjective, but produced a rise and fall of temperature as measured by the thermometer. The temperature of both hands was taken with the bulb of the thermometer held firmly in the middle of the palm, and found to be—right, 89° F.; left, 90° F. Then suggestions of "cold" were made relative to the left arm. Subjective feelings of cold were felt immediately, but no change in temperature took place for three minutes. Then the temperature began to fall, till it reached 85° in the left hand, whilst it remained at 89° in the right. This change took place in the course of ten minutes, and the thermometer was still descending when suggestions of "warmth" were made, which restored the temperature to 89° in the right hand.

Later in the day a much greater change of temperature was obtained by suggestion. The patient was taken out for a five-mile walk without gloves and carrying nothing, and with both hands free, in order to equalise the temperature in both hands. Suggestions were then made of "cold," this time to the right arm, for purposes of control. The arm immediately began to get chilly, subjectively and objectively. In half an hour the temperature in the left palm was 94°, whilst that in the right was 68°. It is interesting to note that this temperature—68°—was the exact temperature of the room at the time, the circulation having apparently no effect on the skin temperature. The right hand appeared and felt to the touch extremely cold, and great discomfort was produced. To the touch the right hand felt like ice, whilst the left hand was comparatively warm. Leaving the thermometer still in the palm of the hand, I then suggested the right hand warm again. Almost immediately the thermometer began to rise, till at the end of 20 minutes the right hand stood at 94° and the left at 95°.

A further remarkable incidence is that, though I have frequently hypnotised this patient, the suggestions of this experiment were made *entirely in the waking condition.*

Relation of Pain to Inflammation.

As already remarked, I had previously produced "suggestion" blisters in this patient, and a blister was also produced by touching the arm with a heated thermometer case, suggesting in the latter case that there would be no pain, either at the time or afterwards. The result was as suggested; but there was no inflammation surrounding the blister, as there was surrounding the painful blister produced by suggestion. This supports the view suggested in my article of November, 1917, that it is not the inflammation primarily that produces the pain or sensation, but the pain that produces the inflammation.

This principle was generally supported by a further observation. After two days the hypnotic blister became infected by the slipping of the bandages, and produced a more extensively painful and inflamed condition. By a word of waking suggestion the pain was abolished, with the result that in two or three minutes the inflammation was also reduced, and the hyperæmia and redness nearly disappeared. It was then found possible, by suggestion of heat and pain, to restore the wound to a painful and inflamed condition once again. The suggestion of "cold" had a more marked effect than that of "painlessness" in bringing about the reduction of inflammation.

Whilst I have mentioned these experiments in particular, they were not isolated, either in this or other patients. I frequently repeated the raising and lowering of the temperature of the arm in this patient. This phenomenon was produced in other patients, not only by myself, but by Captain G. de H. Dawson and Captain O. Connell at Ashhurst Hospital. In these cases, curiously enough, we were able to *raise* the temperature of a hand, but could not *lower* the temperature by suggestion. It is further noted in the cases I observed that when we suggested "heat" to one hand, it was the other hand that *first* showed signs of rising warmth on the thermometer; and then the suggested hand would go ahead and "beat" the other, till there was a very marked difference between the two. The greatest range of temperature that I have observed is the one detailed above; but Captain Dawson claims to have produced a rise of 20°. This, however, was, I believe, in an arm which corresponded closely to the type known by Babinski as "reflex," with a wound and vascular changes present.

If these conclusions of the effect of suggestion on body—and particularly cutaneous—temperature can be estab-

[1] THE LANCET, 1917, ii., 678.

lished it will surely be of great import, both to physiology as a whole and to dermatology in particular. Have not some skin diseases been known to be associated with the neurotic constitution? If the auto-suggestion of a neurotic can influence the circulation and depress the nutrition of the skin in the way that our hetero-suggestion has done in these experiments the connexion becomes obvious. The experiments described above are very tentative and suggestive; there remains the more important experiment of determining whether suggestion can raise and lower the *whole* body temperature. My patient, Mrs. N., to whom my thanks are due for these experiments, performed at considerable discomfort to herself, has placed me under the greater obligation of offering herself for further experimentation.

SUGGESTIONS FOR THE MASS TREATMENT OF HOOKWORM INFECTION.[1]

BY DR. S. T. DARLING,

PROFESSOR OF HYGIENE, FACULDADE DE MEDICINA E CIRURGIA DE S. PAULO.

IN the course of the work of the Malaya Board in the Far East some new data were obtained on hookworm infection and its treatment and on malaria, data of value to the doctor, the employer of native labour, and the administrator. The Malaya Board consisted of Dr. M. A. Barber, Dr. H. P. Hacker, and myself as chairman. It worked in Malaya, Java, and Fiji under the auspices of the British Colonial Office and the Netherland Indies Health Department, and was supported by the Rockefeller Foundation. The object of its researches was to ascertain to what extent hookworm infection affected the working efficiency of the people in the countries named. Our work disclosed the fact that hookworm infection exists to a greater extent in the tropical East than is generally recognised. In most communities and districts the great bulk of the people are agriculturists. Practically 100 per cent. of adolescents and adults of this class are infected with hookworm.

It was shown very positively that there is a correspondence between the degree of infection—that is, the actual number of worms harboured—and the amount of blood loss or anæmia suffered. This loss was frequently hidden or undetectable due to abundant food, opportunities for rest, and to active hæmatopoiesis in certain resistant individuals, but the drain and loss were none the less real, and constituted a tax on the vital powers.

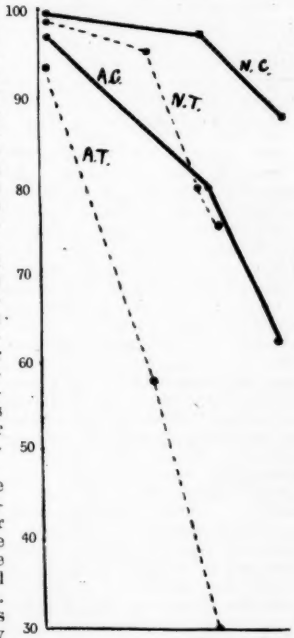
Working with a large number of persons from whom practically all the hookworms had been expelled by vermifuge and counted it was estimated that a given number of hookworms produced a corresponding amount of blood loss. A given number of worms produced more anæmia among children than an equal number in women, and more among women than an equal number in men. Furthermore a given number of *Ankylostoma duodenale* was found to produce a greater degree of anæmia than an equal number of *Necator americanus*, probably due to the more severe hæmorrhage caused by the former worm. Finally, it was estimated that about 12 hookworms are required to cause a loss of 1 per cent. hæmoglobin. When the number of worms harboured is considerable the anæmia caused is evident and measurable; when but few worms are harboured the blood loss may not be detectable.

It is extremely important that emphasis be placed on this fact that hookworms are constantly causing losses of blood through multiple small worm-bites.

Observations made by the Malaya Board are of such a character that the amount of blood loss caused by hookworms and the resulting loss of efficiency can be demonstrated graphically to planters and other employers of labour. Using a rigorous method of diagnosing cases of infection by the administration of vermifuge and comparing it with the less accurate method of microscopic examination of fæces for ova it was ascertained that a larger proportion of the inhabitants of tropical countries are infected with hookworms than is generally suspected. For example, where the microscopic examination revealed in the hands of the lay microscopist an incidence of 75 per cent. infection, diagnosis by vermifuge revealed an incidence of 97 to 100 per cent. The usual method of diagnosis of hookworm infection by microscopic examination of stools for ova does not convey a quantitative idea of the severity of the infection—i.e., the number of worms harboured by an individual—and the degree of injury wrought on the patient. The grade of infection existing runs from 1 to a thousand or more worms. In some villages the average is 40–50 or less; in others 100–150 or more; different villages and special groups of people present infections of different grades of severity.

Diagnosis by means of vermifuge disclosed another fact of extreme importance—namely, that many persons are harbouring a large number of worms, and, consequently are suffering unconsciously from a severe drain in proportion to the number of worms harboured. Thus, a notion was derived not only that oftentimes a higher degree of infection existed than was suspected, but a working knowledge of the number of worms actually being harboured (frequently large) by the people of a locality was obtained. In campaign work it is important to ascertain the number of worms being harboured, for it is more desirable to institute campaigns for treatment in communities where the infections are heavy than where they are light.

The therapeutics of several vermicides, more particularly chenopodium, were investigated by a method in which the efficiency of the drug is expressed by the percentage number of worms a given dosage is able to remove out of the total number harboured. The vermicides could thus be compared one with another according to the actual number of worms removed—the percentage of total worms removed. This affords a more direct and trustworthy index of the efficiency of a vermicide than microscopic examinations of fæces for ova. Chenopodium was found to be more effective than thymol in killing hookworms, and it was even more efficacious in expelling ascaris and other helminths such as oxyuris, trichiuris, and trematodes. Other things being equal, it is better to use the most efficacious drug.



N.C., necator expelled by chenopodium; A.C., ankylostoma expelled by chenopodium; N.T., necator expelled by thymol; A.T., ankylostoma expelled by thymol; O.D., optimum dose.

Toxic symptoms are elicited with all vermicides in the higher dosages; it is therefore necessary to reduce the dose given to as small an amount as possible. Chenopodium retains its vermicidal efficiency upon reduction in dose better than thymol, and this is another reason for its employment. The Malaya Board ascertained that the dosage, 1·5 c.cm. oil of chenopodium, was highly efficient and but slightly toxic, sometimes causing transient dizziness and vomiting. Two treatments of this dosage removed 99 per cent. of the hook-

[1] This paper is based on work done in Java and Brazil, where I was assisted by Dr. M. E. Barnes and Dr. W. G. Smillie, and in part on work done in Malaya and Fiji with Dr. M. A. Barber and Dr. H. P. Hacker. Certain data are extracted from our joint report to the International Health Board which will appear later.

worms present, and this is the dosage recommended. It has a more uniform action—that is, fewer failures occur with it than with thymol; it has a more powerful effect on *A. duodenale*, and is less unpleasant to take than thymol. Not only is the cost of oil of chenopodium much less than that of thymol to effect a given result in worms removed, but oil of chenopodium being a fluid, its vermicidal powers are more uniformly applied, and relative failures in reaching and affecting the worms are less common than with the solid thymol, the spreading powers of which are limited by its physical state. This is an extremely important point to be considered.

The Malaya Board found thymol less effective than chenopodium, and in the following degree (see chart). When the effect on ankylostomas and necators is charted, the more rapid fall in efficiency of thymol over chenopodium with the reduction of dosage is well shown, both in regard to necator and ankylostomas.

Administration of chenopodium in massive or broken doses.—Treatments with 2 c.cm. chenopodium in one massive dose were compared with those in which the oil was given in two broken doses; the difference in efficiency, 95·8 per cent. in the former and 96·15 per cent. in the latter, is slight. Field tests carried out by Dr. Smillie in Brazil show that there is an advantage in the broken dose, as it favours more prolonged contact with the worms, and gives a higher yield of worms removed.

Omission of the preliminary purge.—The omission of the preliminary purge did not materially alter the efficiency of chenopodium in our series when the latter was given in broken doses, but the number of cases was too small to be conclusive on this point.

The purge.—Magnesium sulphate answers the purpose very well; ½ to 1 oz. may be given. Castor oil should not be administered with chenopodium, for it increases the toxic symptoms such as dizziness and deafness. This is probably due to oil of chenopodium being soluble in the castor oil and being absorbed more readily than when given with magnesium sulphate.

With this information at hand, based on experiments in the hospital ward and prison it would seem wise to increase the volume of evidence by conducting additional experiments along the same lines in the field. This is being done. Meanwhile certain modifications in the method of treatment as at present carried out, which would seem to be warranted, may be outlined.

Plan of Treatment.

Personal experience among Chinese, Malays, East Indians, Polynesians, Kaffirs, and Brazilians leads me to believe that an active campaign on an intensive plan rather than a passive dispensary programme must be prosecuted. The people—all the people—must be reached and everyone treated, for they are usually infected with hookworms or other helminths.

Taking the adult agricultural population within the tropics as a whole 90 to 100 per cent. are infected with hookworm and nearly 100 per cent. with helminths. The only place where I encountered a really light infection was in mountain villages in Java and Sumatra. Here only 50 per cent. of the people were infected, and they were harbouring very few worms. The incidence of infection is usually so high that the method of detecting infection by microscopic examination is, as ordinarily carried out, hardly necessary. Consequently within the tropics and where, as in mines and elsewhere, a high incidence of infection prevails the population should be treated *en masse* by an intensive method, and probably without the unnecessary preliminary of examining the stools for ova.

The importance of treating heavily infected communities first.—In inaugurating a campaign against hookworm infection in a tropical country it would seem more humane to select for treatment those communities in which the people are carrying the heavier burden of infection, as, for example, among the agriculturists working in cane, rubber, or coffee. The town-dwellers and others are usually more lightly infected and their case is not so urgent. There is no objection in special instances to treating townspeople, installing latrines, and undertaking educational work for purposes of influencing the agriculturists by means of an example.

In Java, taking men as a class, I found that in four of the kampongs in the City of Batavia the average number of hookworms harboured per man was 50, not a large or relatively incommodious number. In the mountains of the Preanger Residency, in one of the mountain villages, the men harboured only eight worms apiece. In Sumatra, from the Batak highlands, the average was 5·7. On the other hand, in two representative agricultural dessas, of which there are thousands in the East and hundreds in Java, the average numbers of hookworms per man were 378 and 235 respectively. Such numbers constitute a very great burden to the individual and seriously interfere with his health and working efficiency.

There can be no question but that such villages as the last two mentioned should be given the benefit of treatment before the mountainers or the town-dwellers. The information required to ascertain the grade of infection can be obtained within three days and without the aid of microscopists.

If treatment is to be extended rapidly over a vast population, as it should be, the method of treatment must be further simplified, standardised, and cheapened. Millions of people in India are waiting for treatment. The same is true of Brazil and other tropical places. The customary method of examining stools microscopically by a native lay microscopist is expensive, time consuming, and yields untrustworthy results.

Reducing the Cost of Treatment: Economy of Personnel.

Comparing thymol and chenopodium in the dosages in which they yield nearly equivalent results—i.e., 1·5 c.cm. oil of chenopodium, yielding 97·9 per cent. of worms, and thymol, gr. 90, yielding 97·8 per cent. of the worms present, the cost of chenopodium was but $0·027, while that of thymol was $0·135, or exactly 5 times as much. This is based on the cost of thymol at 0·15 cents a grain, and oil of chenopodium at 1·84 a cubic centimetre.

If the method of treatment can be cheapened, the money saved may be used to extend the campaign to places where severely infected people are still waiting for treatment. The Malaya Board inquired into the accuracy of the native microscopist in the East and found that his reports could not be relied on. He was insufficiently trained, his diagnosis was not true, and through a desire to please and to conciliate he would make his microscopic findings fit what he thought was desired. But more than this and of as great importance is the fact that microscopic examination, even when carried out by trained microscopists using a special technique designed to concentrate the ova and thus facilitate the work of detection, fails to detect every case of infection.

This may be seen from the following table: (A) In which the microscope work was done by an expert microscopist using special technique and a re-examination of negative specimens. (B) In which the examinations were made by native or lay microscopists.

Comparison of Results of Microscopic Examination of Fæces for Ova with those of Worms after Vermifuge.

Race.	Result of microscopic examination for ova.		Result by recovery of worms after treatment	
	No. of exams.	Per cent. positive.	No. of exams.	Per cent. positive.
(A).—*F.M.S.*				
Chinese	783	73·4	453	90·1
Tamils	2472	95·3	261	99·6
Malays	206	88·8	97	99·0
(B).—*Fiji.*				
Indian males ...	7637	94·2	131	100
,, females ...			11	90·9
,, children ...			2	100
Fijians, males ...	756	78·7	20	100
,, females ...			4	100
,, children...			9	100
(B).—*Brazil.*				
Brazilian boys ...	72	86·2	72	100

These results of microscopic examinations in the laboratories of the I.H.B. are made by, or under the

supervision of, trained and experienced men. The microscopic technique, when placed in less experienced hands, may be expected to yield results still less trustworthy.

In practice, then, the result of a campaign based on microscopic diagnoses as carried out is to treat thoroughly only a portion of the infected population; the remainder as carriers of infection continue to be a menace. Diagnosis by microscopic examination will vary in accuracy, depending on the skill, persistence, honesty, and technique of the microscopist, and it will probably yield evidences of infection varying between 4 and 23 per cent. less than actually exists. If the microscopists fail to detect this number of instances of infection before treatment, they will probably make almost as great an error in the examinations made after treatment when the number of worms remaining are fewer. Consequently the "cures" based on the microscopic examinations made after treatment are not always valid. The infected persons whose infection the microscopist has failed to detect are not given an opportunity to receive treatment for hookworm, ascaris, tenia, clonorchis, or other helminths with which they may be infected. Moreover, they are given the impression that they are free from infection; yet this large number of infected persons continues to seed their environment, thus leading to their own continued reinfection and to the reinfection of others, including those who have been treated. From a public health standpoint this cannot be regarded in any other light than as unsatisfactory.

The present practice is to treat for "cures"—that is, cases reported as negative by the microscopist after treatment and microscopic examination of stools for ova. But every lot of "cures" contains the error of the microscopist; and besides, a "cure" does not properly indicate the amount of work done in removing worms, nor the benefit received by the patient from the treatments given.

In a recent test made in Brazil we noted that "percentage of cases cured" was not a good indicator of the number of worms removed by treatment, for whereas only 28 per cent. of cases were "cured" by a first treatment of chenopodium, 90·8 per cent. of their hookworms were actually removed, and when only 49 per cent. of the cases were "cured" by two treatments 97·1 per cent. of the hookworms were actually removed. It is evident that worms removed is more important and is a better criterion of work accomplished than the microscopist's "cures." When we consider the millions of people in the tropics in need of treatment and the slow progress of the campaign work, the last few hookworms remaining after two or three 1½ c.cm. chenopodium treatments are probably doing too little harm to waste time and money over.

The Importance of Mass Treatment of Inhabitants Instead of Intensive Treatment of Individuals.

It is not necessary to remove the very last few hookworms, for it is not the two or three worms a man may retain after treatment that are doing the great harm, but it is the 150 or more worms that are busy in the great mass of untreated humanity in tropical and subtropical lands. It is not usual in practice for all the worms to be expelled by treatment; they are reduced to a minimum—a condition highly desirable from the patient's point of view. The public health officer wants every last worm removed from everybody, but that is impossible of achievement. In every district a good number of persons escape treatment; they happen to be ill, are absent, remove to another district, or enter the district after the census has been taken. We may say that 6 per cent. of the population remain untreated. This number, added to the number of positive cases which the microscopist failed to detect, makes a total of approximately 19 per cent. of the total population remaining infected. This number of carriers the public health officer does not get rid of by present methods. Thus while he is striving for "cures" in four-fifths of the population, the other one-fifth escapes him to continue infecting their environment.

Now, by reducing the dosage of chenopodium to a quantity safe and free from toxic manifestations and by giving two or three treatments, and thus removing 97–99 per cent. of the worms, it will be possible to treat the *entire population* in safety, and we shall be making a close approximation to the desideratum of the public health officer.

Hookworm Treatment in Malarial Communities.

Hookworm treatment will oftentimes have to be carried out in communities where more or less severe malaria coexists. It is, in fact, highly important that treatment should be carried out in these places, for hookworm infection appears to be more severe in those cases of malaria which are associated with a palpable or enlarged spleen. It may be that infection with a relatively large number of hookworms favours the development of splenic enlargement and the continuation of this state after acquiring malarial infection, or malaria may predispose to severer hookworm infection; in any case, the fact remains. In Batavia Jail I found that 63 men with negative spleens, though constantly exposed to malaria, had an average of 58 worms apiece, while 14 men with enlarged spleens similarly exposed to malaria had 120 hookworms apiece; 29 men with palpable spleens had 98 hookworms apiece. We have, then, not only a strong reason for treating these cases of hookworm infection whose anæmia is usually so severe, but a reason for treating malaria as well.

It must be explained to the people that their anæmia and debility are not only due to hookworm infection, but to a great—even greater—extent to malaria, and that while it is of great benefit to the individual to be rid of hookworm infection improvement will not follow unless malaria is gotten rid of at the same time. All the anæmia encountered among the people should not be attributed to malaria nor to hookworm. Underfeeding in rural communities plays an important part in contributing to the general anæmia and debility due to these three handmaidens of death.

In Fiji it was estimated that underfeeding resulted in a group of East Indians having 9·5 per cent. lower hæmoglobin than another well-fed group of the same race. Each group harboured the same number of hookworms. In the jail in Batavia taking the 109 treated prisoners as a whole, their hæmoglobin was 25·8 points per cent. below normal (95 per cent.). I estimated that 6·8 points loss were due to hookworm infection, 10·3 points to malaria, and 8 points loss were due to hard labour. In many rural communities the people or the employers of labour can be instructed in the means used to prevent malaria. In the Far East members of the Malaya Board investigated malaria and hookworm infection at the same time. It was their practice to make a malarial survey of each estate visited. They were frequently of service to planters by being able to point out the breeding-places of anopheline malarial carriers, and advise them of the measures which might be taken. In Java during the hookworm survey a malarial survey was made of each district visited, and the amount of malaria existing in the district estimated before beginning the treatments and worm counts. In these backward or neglected communities, where rural hygiene still remains in a primitive state, the men in charge of hookworm prophylaxis have a splendid opportunity to advise the people as to the malarial measures most suitable for the locality. Oftentimes a simple filling, ditching, or drainage operation is all that is needed to destroy a bad breeding-place and to rid the community of its greatest menace.

Suggestions for Conducting a Campaign.

It is first advisable to ascertain the degree of infection in different regions and among different classes of the population in order that groups most severely infected may be treated first. The local medical authorities should be consulted to get the benefit of their knowledge on the severity of cases of infection already encountered. A general inspection of the district or country should be made with the local medical men to ascertain the topographic, climatic, and economic features. The district or country should be split up in such a way

that characteristic groups of the people may be examined and sampled. Plantations and estates cultivating sugar, coffee, rice, or rubber, mining populations, fishing villages on the coast, town dwellers, should be treated separately. Attention to the character of soil, altitude, temperature, distance from sea, and proximity to malarial localities, ethnic stock, relative prosperity or economic position, are among the categories which should influence one in dividing the people into groups for sampling.

In coöperation with the administrative medical authorities, a survey may be made. The population is either mustered or visited domiciliarly; the former is preferable whenever possible. A spleen census is taken, and hæmoglobin determinations are made, and blood is withdrawn at the same time for determining endemic index (malarial plasmodia). A representative sample of the population is now chosen; this is based on the results of the spleen and hæmoglobin determinations, and they are treated and their worm counts ascertained; 3 c.cm. of chenopodium is the adult dosage for this. The sample should consist of men, women and children. The worm-count will disclose the number of worms actually being harboured. A knowledge of this is of greater importance than the incidence of infection as determined by the lay microscopist.

With a knowledge gained of the degree of infection actually existing among the different classes of people and in different communities as influenced by occupation and economic conditions, a selection can be made of the districts or classes of persons which it is desired to treat first, naturally with the object of treating first those persons in whom the infection has been demonstrated to be most severe.

All grades of infection will be encountered in the surveys. Some grades will call for immediate treatment, others for deferred treatment. This will have to be thoroughly worked out in the field in accordance with the actual findings. Tentatively it may be said that the grades of infection may be rated as: mild, 50 and under; moderate, 50 to 100; severe, 100 and over.

I should recommend that communities in which the adults have an average of 50 or less do not urgently require treatment, while those with more than 50 should be treated. In carrying out treatment the two-treatment plan may be pursued, microscopists being dispensed with. Every person in the group, excepting very young children, should be treated. Persons ill with chronic nervous diseases may be treated with thymol or other vermicide. Pregnancy and severe anæmia are not contra-indications to the administration of chenopodium. The drug and dosage is chenopodium 1½ c.cm., given in single or broken doses in hard gelatin capsules. The preliminary purge before medication may be omitted, but in this case the evening meal should be light and food then interdicted until after the post-vermicidal purge, which may be given two to three hours after the exhibition of the chenopodium. The post-vermicidal purgation should be very thorough, for it is extremely important that the chenopodium, being a neurotoxic drug with cumulative powers, should be as thoroughly expelled as the worms, and at the earliest possible moment after the drug has accomplished its purpose on the worms.

In hookworm control, if permanent results are to be achieved, prophylaxis as well as treatment of infection must be considered. On first view it would seem that the installation of latrines and the education of the people in their use and in a better personal hygiene requires that the personnel attached to the post should remain in the village long enough to have thoroughly impressed the inhabitants with the importance of the work. They should probably not leave after merely treating them. Nevertheless, important as is the education of the people in a better personal hygiene, the riddance of the hookworm handicap of the people at large is of greater immediate importance. This handicap cannot be fully appreciated by those who are conducting campaigns, unless they actually study the subject by means of the hæmoglobinometer and by making worm counts of representative samples of the population, so as to familiarise themselves with the actual number of worms being harboured by the people. When this is done the oftentimes enormous amount of curable debility and economic inefficiency caused by hookworms is made apparent and may be estimated numerically.

With a knowledge of this debility, as revealed in samples of the population, comes the desire to relieve all the people of it at once, without waiting for the educational part of the programme.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

TWO CASES OF PARALYSIS AGITANS

OCCURRING BEFORE THE THIRTIETH YEAR.

BY E. DANVERS-ATKINSON, M.B. LOND.,

AND

CECIL WORSTER-DROUGHT, M.A., M.D. CAMB.,

NEUROLOGISTS TO OUT-PATIENT DEPARTMENT FOR NERVOUS DISEASES, BETHLEM ROYAL HOSPITAL, AND TO MINISTRY OF PENSIONS.

PARALYSIS agitans (Parkinson's disease) rarely develops under the age of 40, the usual age-incidence being between 50 and 70 years. It is true that a few cases have been recorded in patients under 19, but in some at least it is by no means certain that the diagnosis was correct.

CASE 1.—E. S., aged 30, seen in March of this year. There is no family history of mental or nervous disorder beyond the fact that his mother is said to have died from a "stroke" at the age of 52. He is married and has one child, aged 4, quite healthy.

History of condition.—He states that he has had no previous illnesses of importance, always having been healthy and played games such as cricket and football. He enlisted in the army (infantry) in June, 1916, being classified "A," and proceeded to France in October of the same year. During the winter of 1916-17 his left arm gradually became "weak" and somewhat stiff, but he was able to carry on at duty until September, 1917, when he was slightly wounded in the right arm by a fragment of shell. The wound, however, became septic, and on this account he was invalided to England. On leaving hospital about two months later he states that he "went to pieces"; his limbs rapidly became increasingly stiff, the character of his speech gradually changed, and he experienced great difficulty in getting about owing to general muscular weakness.

Condition on examination.—Cranial nerves: Pupils moderate in size, reaction to light somewhat sluggish, consensual reactions present, accommodation normal; no nystagmus, ocular muscles normal, fundi normal. The face is immobile and expressionless, the mouth invariably slightly open, with occasional dribbling of saliva. The voice is monotonous and the speech hurried. No sensory disturbance. Motor attitude: The head is bowed forward, the back arched, the upper arm held slightly abducted, the elbows flexed, the forearms partially pronated, the wrist and metacarpo-phalangeal joints slightly extended, and the thumb opposed towards the index finger; the hips and knees are slightly flexed. Rigidity of the spinal muscles and limbs is pronounced, and in turning round he rotates as one mass, without movement at the hips or shoulders. "Pill-rolling" tremor is occasionally present, and can be inhibited for a short time on voluntary effort; there is also a periodical antero-posterior tremor of the head. The gait is festinant, and propulsion and retropulsion are both marked. The wrist-, supinator-, biceps-, and triceps-jerks are all somewhat brisk, those on the left side being slightly greater than those on the right. The knee- and ankle-jerks are moderate and equal on the two sides, and the plantar reflexes are flexor. The abdominal and epigastric reflexes are brisk and equal. There is no incoördination of the upper or lower limbs and the sphincters are unaffected. Mentally, he is apathetic, egocentric, and somewhat depressed, but otherwise normal. The heart, lungs, and digestion are normal. The blood-vessels are not unduly thickened, and the systolic blood pressure is 135 mm. Hg. The urine shows no albumin, sugar, nor abnormal deposit. The blood serum yields a negative Wassermann reaction.

CASE 2.—H. B. T., aged 30. There is no history of mental or nervous disease in the family, nor did the patient suffer from any illness prior to 1914.

History of condition.—The patient enlisted on the outbreak of war in 1914 and was sent to Malta on duty. After serving 21 months there, he was invalided home suffering from nephritis; he received treatment in hospital, and after a few weeks was able to return to duty. In May, 1916, he fell from his horse, and states that he sustained "concussion of the brain." This was followed by "traumatic neurasthenia," the symptoms consisting of headache, palpitation, and general nervousness. Finally, he was invalided from the army in January, 1917. About ten months later, he noticed a tremor beginning in the fingers of his left hand, and

states that the left arm "trembled" at night when in bed. After four months the tremor of the left arm had become almost constant, and the same symptom was beginning in the lower limbs. A medical board, in October, 1918, noted the above symptoms, together with a progressive loss of power in the legs, and the facial expression was reported as being "fixed."

Condition on examination (1920).—He complains of general stiffness and weakness, the latter being especially pronounced in the left arm and leg, palpitation, vertiginous sensations, and tremulousness. Cranial nerves: Pupils equal and react normally, no nystagmus, ocular muscles normal, fundi normal. The face shows the characteristic immobility and lack of expression described as "Parkinson's mask." His speech is dull and pitched in a monotone. There are left-sided hyper-æsthesia and hyperalgesia, and cold is felt more acutely on the left side. Motor attitude: The trunk and limbs are held rigidly, and all movements are executed with marked slowness. The gait approximates to the spastic type, but without shuffling of the feet, and in turning patient moves as one piece in a statuesque manner. Propulsion and retropulsion are well marked. There is a slight tendency to a kyphotic attitude, and also for the flexors of the forearm to overbalance the extensors. He exhibits a typical "pill-rolling" movement of the left thumb and forefinger with a rhythmical tremor of the left forearm and leg of flexion-extension type. His control of these tremors varies, at times voluntary effort will control the tremor for a short period, an exacerbation following the period of control, while at others the effort only serves to amplify the tremor. There is considerable weakness of the left upper and lower limbs, particularly the left hand-grip. The wrist, supinator, biceps, and triceps jerks are normal and equal, the knee- and ankle-jerks brisk and equal, and the plantar reflexes flexor. The epigastric and abdominal reflexes are also normal and equal. There is no incoördination of upper or lower limbs and the sphincters are normal. Mentally he is self-centred but otherwise normal. The heart, lungs, and other viscera are normal, the systolic blood pressure is 160 mm. Hg, and the urine pale, of specific gravity 1002, and shows the presence of albumin.

Remarks.

From the above description of these two cases it will be seen that the syndromes closely related to paralysis agitans; and more likely to be met with early in life—such as Wilson's lenticular degeneration, Hunt's and Vogts' syndromes—can be excluded. The cases are of interest not only on account of the unusually early age, but because both patients were soldiers, in whom true paralysis agitans is very rarely seen. In four years of army neurological work during the war, one of us (C. W.-D.) did not meet with a single case of the disease (although many examples of functional nervous disorder were received erroneously diagnosed as paralysis agitans), and Dr. A. F. Hurst informed us last year that his experience had been similar. Further, at the Special Neurological Board (Ministry of Pensions), where many cases of disease of the nervous system are seen daily, no example, excepting the cases here recorded, under 50 years has been met with. This is of importance, as trauma and "shock" are often said to be exciting causes of paralysis agitans.

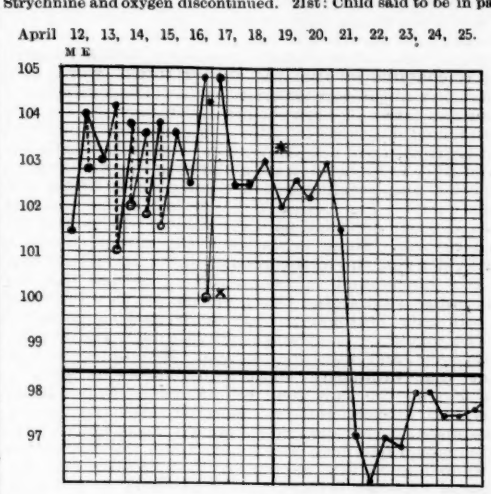
"CENTRAL" PNEUMONIA IN A CHILD OF TWO.

BY H. O. GUNEWARDENE, M.B., B.S. LOND.

THE unusual features of this case are: (1) that the crisis did not occur till the fourteenth day; (2) that the pneumonia was of the central variety and the physical signs of consolidation did not appear till the ninth day; and (3) that the temperature was maintained at two levels during the course of the illness for about nine days between 103·5° and 104·5° F. and for five days between 102° and 103°; the fall to the lower range suggests the crisis following the inflammation of the area of lung primarily involved, masked by the fever due to the subsequent involvement of another area; there is also apparent the so-called precritical rise before the arrested crisis. (See Chart.) The real crisis is a protracted one.

Notes on the Case.

Doris J., aged 2, who had been under my care for some time for another complaint, was brought to me on April 9th, having been sick twice that day and very drowsy. History of two days' illness. Temp. 103·4°; alæ working; pulse 140 (counted at apex); respirations 50: nil in chest, abdomen, throat, or elsewhere; bowels not open. Given ol. ric. drs. 3 stat, and confectio sennæ. April 10th: As above; no physical signs; ? central pneumonia. 11th: As above. Slight impairment of note over right infrascapular region along line of interlobar fissure. Child seems comfortable, but takes very little nourishment. 13th: Restless, sings in sleep, slight cough; tepid sponge b.d.; is visited daily by nurse. Given mist. ipecac. ammon. with pot. brom. six-hourly, aspirin at night. Icebag to the head. 14th: Pallid; good heart sounds, no dullness to right of sternum; respirations 60; note impaired as before. Brandy m. 30, six-hourly. 15th: More pallid. Restless at times; impaired note along line of fissure as well as above it, and also over right mid lobe. 16th: Dullness marked; distant bronchial breathing over infrascapular region; phenazonum gr. 3 at 7.30 P.M. 17th: Physical signs as above, with a few fine crepitations at the end of inspiration, ? pleural. Attacks of breathlessness fairly frequent. Strychnine hypodermically b.d. Appearance much better and breathing easier after strychnine. 18th: Restless at night; bronchial breathing, also in front above fourth rib; cough loose; colour still bad. 19th: "Had a very bad night," "fighting for breath"; colour bad; note impaired below line of fissure; markedly dull above it, but no fluid resistance. Explored with negative result. Oxygen p.r.n. Mist. ammon. c. ether. 20th: Little better, had better night. Pulse, respirations, lung as before. Heart, no dilatation. Strychnine and oxygen discontinued. 21st: Child said to be in pain



Dotted line shows fall due to tepid sponging. × Fall due to phenazonum, gr. iii. * Explored.

and restless. Nothing found to account for pain. Seems comfortable. Temp. 100° at noon; evening temp. 97°. Pulse 120, respirations 30; much stronger; colour good. 22nd: Note still impaired, but better; few creps. behind and bronchial breathing in front. Given mist. ipecac. ammon. 24th: Child well; a few fine, distant creps.; still slight impairment on right side.

Dr. Still[1] refers to a case in which the fever lasted 15 days; and Dr. Pye-Smith, in Clifford Allbutt's "System of Medicine" says it may last as long as 26 days. Tepid sponging was employed, as I was reluctant to leave the child with a high temperature in the absence of a nurse, in view of the possibility of it rising higher. Aspirin on two occasions gave the child definite relief, but had little effect on the temperature, whilst phenazonum, used once only, caused a fall which lasted three hours and gave marked relief. The heart was strong throughout the illness. The exploration was done to exclude a possible interlobar empyema, suggested by the bad colour of the child on April 18th and 19th and the frequent attacks of dyspnœa, though sweating was absent and the chart did not indicate pus. Osler's[2] statement that empyema should be suspected if the fever persisted beyond the tenth day encouraged the exploration. The pulse and respirations did not fall with the temperature. The child is now perfectly well, with normal pulse and respirations.

I am greatly indebted to the staff of the Fulham District Nursing Association, whose invaluable services to the poor make possible the home treatment of cases of this kind without diminishing the chances of recovery.

[1] The Commoner Disorders and Diseases of Childhood.
[2] Principles and Practice of Medicine.

ROYAL VISIT TO A MEDICAL SCHOOL.—H.R.H. Princess Mary paid an informal visit to the London (Royal Free Hospital) School of Medicine for Women (University of London), on July 1st. She was received by the Dean of the School, Dr. Louisa Aldrich-Blake, Dr. May Thorne, and Miss L. M. Brooks. The Princess made a complete tour of the building, and showed much interest in the arrangements made for the residence of students, and in their work before and after qualification.

Reviews and Notices of Books.

L'INFECTION BACILLAIRE ET LA TUBERCULOSE

Chez l'Homme et chez les Animaux. By A. CALMETTE. Paris: Masson et Cie. 1920. With 31 text figures and 25 coloured plates. Pp. 620. Fr. 55.

WHETHER such a book as this is really necessary just now might be open to question; if it is a luxury it is a very nice one—and appropriately expensive. Roughly speaking, it contains all that the author thinks worth consideration about the tubercle bacillus and tuberculosis from the point of view of the laboratory worker and sanitarian; diagnosis by other than laboratory methods and treatment are not dealt with. Practical details are given fully in a useful way, and the large problems of infection and resistance are treated in a broad and eager spirit. The considered opinions of one who has been so much occupied with the subject will be received with respect. Some years since the author caused a stir by denying the importance of direct aerial infection of the lungs, and it is interesting to find that he still thinks that in the vast majority of cases infection is primarily lymphatic, the bacilli gaining entrance by the digestive tract and chiefly through the buccal, pharyngeal, and intestinal mucosa. He emphasises the point that ordinarily adult tuberculosis is greatly modified by the fact that its processes evolve in an individual already infected more or less and partly immunised, partly sensitised. He evidently thinks that quite enough fuss has been made about the distinction between human and bovine bacilli, and dismisses the question whether tuberculosis is catching or not with the simple truth that tuberculous infection is caused only by the tubercle bacillus. The final chapter gives an admirable summary of his outlook on prophylaxis. The whole point is, he says: 1. To control the dissemination of bacilli; the danger comes not only from those with manifest phthisis, but from all the host of people who, often without symptoms, are infected and intermittently excrete bacilli; every human or bovine who reacts to tuberculin is a possible source of evil. 2. To find some means of deliberately producing the resistance which is developed by the common small benign infections of childhood. The gospel is definite if not very surely founded in all its details; perhaps good gospels seldom are. English readers will miss any discussion of the relation between silica dust and pulmonary tuberculosis. Its practical importance has probably not yet been realised in France; but one would have liked to know what Calmette thought of the theoretical aspects of the question, especially of the explanation of the protective action of coal-dust, worked out experimentally by Mavrogordato,[1] which is among the most pregnant of recent discoveries in pulmonary and general pathology.

The book is very well printed on several sorts of paper. References to the literature are given in the most convenient way at the foot of the page; there is no index. It can be heartily commended to anyone interested in the subject, who will find in it a great mass of information and clear-cut, interesting opinions.

THE SYMPATHETIC NERVOUS SYSTEM IN DISEASE.

By W. LANGDON BROWN, M.A., M.D., F.R.C.P., Physician with Charge of Out-patients, St. Bartholomew's Hospital, &c. London: Henry Frowde, and Hodder and Stoughton. 1920. Pp. 161. 10*s*. 6*d*.

Dr. Langdon Brown's book is an amplification of his Croonian Lectures, which have already appeared in the columns of THE LANCET. In it less attention is paid to the morphological details of the system than to its clinical symptomatology, and less, again, to a complete résumé of every symptom imaginable than to its behaviour in a few large nosological groups—viz., affections of the endocrine glands, of the digestive and circulatory systems, and glycosuria. In this fashion the beginner obtains a better conception of its function, and learns how to apply principles to other morbid conditions, the outcome of sympathetic disturbances.

The value of Dr. Langdon Brown's little volume consists as much in its suggestiveness as in the actual information it embodies. The chapter on the relation of the system to the endocrine glands contains much interesting clinical material in reference to so-called diabetes insipidus, and a suggestive hint on the pharmacological action of valerian, a drug which is persistently decried by that scorner of all drugs the pure psychotherapist. We wish that the author had devoted more space to the possible effect of psychogenic factors on the function of the sympathetic system, for he is fully alive to the importance of this, and, indeed, supplies various clinical instances. It is probable that the future will see more attention paid to the actual pathology and pathological physiology of sympathetic disturbances, and that their outcome in emotional symptoms will be approached, therapeutically, from below as well as from above.

MILITARY PSYCHIATRY IN PEACE AND WAR.

By C. STANFORD READ, M.D., Physician, Fisherton House Mental Hospital, Salisbury; late Major, R.A.M.C., Officer in Charge of "D" Block, Royal Victoria Hospital, Netley. London: H. K. Lewis and Co. 1920. With two charts. Pp. 168. 10*s*. 6*d*.

BY being in charge of the well-known "D" block at Netley during much of the war Dr. Stanford Read enjoyed exceptional opportunities for the prosecution of statistical and other studies in connexion with war psychiatry, and these are embodied in an interesting manner in this monograph. It is based more particularly on the investigation of 3000 consecutive cases admitted during 1917. Without giving the complete table of classification the following percentages may be quoted: Dementia præcox, 20; manic-depressive insanity, 14·3; confusional states, 17·1; paranoia and varieties, 16·6; mental deficiency, 13; general paralysis, 4·7; alcoholic psychoses, 1·6; epileptic psychoses, 1·2. Dr. Stanford Read's general attitude is one of enthusiastic acceptance of a psychogenic origin for the majority of the psychoses. For him dementia præcox "results from a faulty adjustment of life's demands," and "disharmonies in sexual adaptations constitute themselves an integral part of the disorder"; the psychological basis of paranoiac states is "of a homosexual nature," and only thus can we understand why "the paranoid trend is so extremely common a reaction among the war psychoses"; the anxiety of manic-depressive cases is, in fact, fear of ungratified desire of a sexual nature; as for alcoholism, "there are good grounds for believing" that "unconscious homosexual activity is capable of stimulating the craving for alcohol." There is a frank tendency on the author's part to emphasise the psychical at the expense, we think, of the physical, even in regard to actual commotio cerebralis and the toxæmias of various kinds, due in part, no doubt, to the line in which his own medical interests lay, and to the atmosphere in which he found himself. If a patient has both malaria and a confusional state the psychologist, naturally, "spreads himself" on the latter; notwithstanding the intimate relation between emotions and internal secretions Dr. Stanford Read dismisses disturbances of the latter as of no ætiological importance.

We consider some of the most valuable work in the book is in connexion with the problems of the enlistment of the mentally unfit and of the improvement of the mental status of the soldier, and we welcome the sane and practical conclusions of the author thereanent. His commonsense attitude is excellently expressed in the following quotation: "If means were taken that soldiers could more freely vent grievances and feel that sympathy and understanding were given them, if personal worries could be aired and advice sought, and if as little as possible any rankling sense of injustice were allowed to exist by a deeper study of those who come in conflict with disciplinary law, many a mental disorder might be nipped in the bud." The volume concludes with a cogent plea for adequate instruction in practical psychology as a part of the medical curriculum.

[1] Journal of Hygiene, xvii., p. 439.

BODILY CHANGES IN PAIN, HUNGER, FEAR, AND RAGE.

An Account of Recent Researches into the Function of Emotional Excitement. By WALTER B. CANNON, M.D., B.C., Professor of Physiology in Harvard University. London and New York: D. Appleton and Co. 1920. Pp. 311. 15*s*.

THE physiologist has begun to tackle the problem of the emotions seriously and patiently. He, of all scientific workers, is most likely to be content with nothing less than experimental exactitude, and his interpretation of results is worth as much consideration as that of the psychologist. Everyone knows it is a long step from the neuronal simplicity of the dog to the complexity of man, but the applicability of data obtained in the laboratory to man is not thereby negatived. Professor Cannon's general thesis, amply sustained by experiment, is that in pain and other emotional excitement certain reflex bodily responses occur which are to be regarded as anticipatory of the instinctive acts that naturally follow. Further, a mechanism exists whereby the changes initiated in an anticipatory manner by emotional excitement are continued or augmented by the emotion itself. By way of illustration it may be stated that certain alimentary processes cease and energy-supply for other parts is set free; blood is shifted from the abdominal organs to those immediately essential to muscular exertion (lungs, heart, central nervous system); energy-giving sugar in the circulation is mobilised—and all of these visceral changes are directly serviceable in making the organism more effective in the violent display of energy which fear, or rage, or pain may involve. Thus these dominant emotions are expressed in activity of the sympathetic system, but the visceral changes are more or less alike, though the emotions giving rise to them are different. Now if anger, terror, pain, anxiety, joy, grief, or deep disgust have as accompaniment acceleration of the heart, inhibition of stomach and intestinal movement, contraction of blood-vessels, liberation of sugar, &c., it follows, in the author's opinion, that the James theory of the emotions cannot be maintained, for the subjective quality of the emotions undoubtedly varies, yet the visceral responses are more or less uniform. The suggestion is that the visceral changes contribute to the emotional complex, but do not constitute it, and that, with the possible exception of anger, emotions cannot be expressed, and, presumably, felt, without the aid of the cerebral hemispheres.

DIATHERMY.

By CLAUDE SABERTON, M.D. London: Cassell and Co. 1920. Pp. 138. 7*s*. 6*d*.

THIS book is divided into three parts. The first part commences with a short historical account of the evolution of diathermy. The principles on which high-frequency currents are obtained are then explained, and various models of diathermy apparatus and methods of applying the current to the body are described. The second part deals with the medical uses of diathermy. The diseases and symptoms for which this form of treatment is recommended are next considered, and the methods of its application discussed for diseases of the circulatory and nervous systems, fibrositis, scars and adhesions, and diseases of joints; and some notes are added on its use in cases of pulmonary tuberculosis, pleural effusion, and certain other affections. The third part of the book deals with the surgical uses of diathermy; the principles of the method are described and its advantages indicated. Mr. Herbert Frankling, of Harrogate, has added a description of his method of performing cauterisation, by diathermy, of papillomata of the bladder by the suprapubic route, and of carcinoma of the tongue.

This is the first inclusive work on diathermy by an English author. Dr. Saberton gives his own experience and refers to the work of several authors, quoting freely from the writings of others. The book will be read with interest by those who are experienced in treatment by diathermy, and will be of considerable use to others who are anxious to know more of the subject. The addition of diagrams would have assisted beginners to understand the complex diathermy machine, and the factors determining the depth to which coagulation extends in various tissues might with advantage have been more fully discussed. There are a few trivial slips; on p. 2, "Wertheim, Salomanson" should be "Wertheim Salomonson"; on p. 29 units of heat are given in "litres"; but the book is clearly written and well prepared, and there is a full bibliography.

GENITO-URINARY DISEASES.

Transactions of the Section on Genito-Urinary Diseases of the American Medical Association at the Sixty-seventh Annual Session, June, 1916. Chicago: American Medical Association Press. 1916. Pp. 350.

THIS volume consists of a collection of papers read before the American Medical Association. Each paper contains a report of original work carried out by the writer; many of these also have appended verbatim reports of the discussions which followed the reading of the paper. The papers are of interest in that they deal with the difficulties met with in the treatment and diagnosis of genito-urinary diseases. One of the more important of them emphasises the value of the Gradwohl test in the diagnosis of syphilis, comparing its accuracy with that of the Wassermann test; in the subsequent discussion it appears that all observers hold the view that it is the best test at present available. The post-operative complications of prostatectomy are gone into in several papers, and it is interesting to note that a number of operators are averse from the use of irrigation after the operation. The idea of collecting papers in this way is one which should be imitated.

LES INFECTIONS GANGRÉNEUSES DES MEMBRES CONSÉCUTIVES AUX PLAIES DE GUERRE.

By G. LARDENNOIS and J. BAUMEL. Paris: Masson et Cie. 1920. Pp. 248. Fr.12.

THE first few pages of the book are devoted to a brief historical account of the subject; then follow sections dealing with the ætiology, pathology, symptomatology, diagnosis, prognosis, and treatment of gas gangrene. The last 20 pages contain a valuable bibliography, wherein references to many of the more important publications on gas gangrene may be found. The section on ætiology contains a brief but accurate description of the *Vibrion septique*, *B. perfringens*, *B. œdematiens*, *B. bellonensis*, and *B. sporogenes*. The importance of mixed infections with other organisms, especially streptococci, is duly emphasised. The various factors predisposing to gas gangrene are also considered. In the section on symptomatology, certainly one of the best in the book, a good description is given of the initial signs and symptoms of gas gangrene, and the value of early diagnosis, followed by immediate treatment, is pointed out. The authors recognise the following types of gas gangrene: Gas gangrene proper, localised or spreading; toxic types accompanied by great swelling of the muscles or extensive œdema; and gaseous phlegmons, localised or diffuse.

Treatment is considered under two headings: preventive and curative. Under the first the authors pass in review the various ways in which wounds have been dealt with during the war. The description given is rather sketchy, and those methods which were discarded after a brief period of popularity could easily have been left out. Removal of the projectile and other foreign bodies and complete and methodical excision of the wound, followed by suture in suitable cases, is rightly recommended as the best way of avoiding gas gangrene. Excision of the infected area or amputation of the limb is the treatment advised for cases of established gangrene. A good account of the use of vaccines and specific sera is also given.

The book is mainly the outcome of the personal experience of the authors, but the work of others has also been freely drawn upon. It is to be welcomed as a useful addition to the literature of the subject.

HANDBOOK OF DISEASES OF THE NOSE, THROAT, AND EAR.

For Students and Practitioners. By W. S. SYME, M.D., F.R.F.P. & S.G., F.R.S.E., Surgeon to the Ear, Nose, and Throat Hospital, Glasgow; Extra-academical Lecturer on Diseases of the Throat and Nose, Glasgow University. Edinburgh: E. and S. Livingstone. 1920. Pp. 329. 9s.

THIS is an attempt to compress an adequate description of diseases of the nose, throat, and ear into a very small compass, and it is not particularly successful. The teaching is perfectly sound and shows evidence of wide clinical experience, but it does not afford the complete and concise statements which are required by the student for examination purposes; nor, on the other hand, does it give those hints and details of treatment which would be helpful to the practitioner. Thus, as one instance out of many, the article on epistaxis will not suffice for the student faced with a question on its causation, and will not be a guide to the doctor who has to treat the affection. The illustrations are few and not very helpful. In any subsequent edition Dr. Syme will be well advised to leave out altogether the perfunctory mention of rare affections to make room for fuller treatment of common diseases.

MICROSCOPY.

Third edition. By E. J. SPITTA. London: John Murray. 1920. Pp. 534. 25s.

OF the common instruments of medicine the microscope is perhaps the one least generally understood and most often wrongly used. The general tendency of students is to try to obtain the largest magnification of an image possible with the objectives and eye-pieces available. They seldom use the instrument in order to gain the maximum knowledge of the object studied, and even qualified medical men do not always use their microscopes intelligently. "Microscopy" teaches in simple language and with the aid of large numbers of diagrams and photographs the elementary laws of optics and the principles of instrument construction, and shows very clearly the limitations of the microscope as well as the methods by which the best possible image may be obtained. The book is not written for medical men alone, but it will be especially valuable to them. The third edition is revised and considerably enlarged. New sections of special interest are added, notably on the use of combinations specially designed for the study of large objects at low magnifications. The later developments of microscopy—for example, the use of short wave-length films for improving the resolving power of objectives of large numerical aperture—are not neglected.

The book is well produced, the plates being especially beautiful.

ERGEBNISSE DER GESAMTEN MEDIZIN.

By Professor Dr. TH. BRUGSCH. Erster Band. Berlin and Vienna: Urban and Schwarzenberg. 1920. Pp. 657+vi. M.180.

THE aim of this book is to provide a summary of the advances which take place in medicine year by year. The first volume covers a wide range of subjects, including gynæcology, radiology, nervous diseases, acute fevers, tropical diseases, and so forth. There are 25 chapters, each being a short monograph on the subject under discussion. The book differs from our *Medical Annual* in that no attempt is made to summarise all the important work of the year. It is not clear what system has been followed in the choice of the subjects. Infective diseases receive a generous share, respiratory diseases a very poor one. It is clear, however, that even a volume of more than 600 pages cannot contain all the new work in the whole realm of medicine, unless it be rigorously edited. The editing is, however, uneven. Some chapters contain a list of references to German work only; others give a more cosmopolitan list of French, English, and American publications, whilst in some instances—for example, the omission of Besredka's work in the chapter on Anaphylaxis—the absence of a bibliography gravely reduces the practical value of the book. Inability to obtain access to recent foreign work may be responsible for this apparent neglect.

It is manifestly impossible to review adequately a book dealing with such diverse material. Of the diseases to which the war has attracted interest, typhus fever receives a comprehensive monograph, with a page and a half of references; "five-day fever," which has figured so largely in German medical literature during the war, is dealt with, and the chapters on protozoal diseases discuss amœbæ, hæmorrhagic jaundice, and diseases of the intestine. There is also a lengthy review of the sunlight treatment of surgical tuberculosis, with numerous illustrations. The book is unbound and contains no subject index.

BACKWATERS OF LETHE.

By E. A. H. BARTON. London: H. K. Lewis and Co. 1920. Pp. 151. 5s.

THE serious student need not be alarmed by the unconventional title of this book and of some of its chapters, as the contents are for the most part orthodox. Dr. Barton has rescued from the stream of oblivion many things worth remembering by those who give anæsthetics. Under the title of "Arma Virumque Cano," he discusses the anæsthetist's qualifications and apparatus, while "shoals and rapids" covers a useful discussion of common difficulties and dangers. Good examples are given to illustrate the danger of too light and too deep narcotisation with chloroform. The author's favourite method is a succession of C.E., ethyl chloride, and ether carried out by means of an open mask and the inhaler of his own design, which includes a face-piece and circular metal pillar. With this apparatus Dr. Barton gives "open" ether, but the effects must surely differ in degree from those obtained with a perfectly open mask and a drop-bottle. Dr. Barton recommends morphine with atropine before ether and uses it more freely than do some of his colleagues. The author is evidently both enthusiastic and critical, and has collected in this book a number of wise judgments and opinions resulting from his extensive experience in a branch of practice to which too little attention has hitherto been given.

FOOD POISONING AND FOOD INFECTION.

By WILLIAM G. SAVAGE, B.Sc., M.D. Lond., D.P.H. Cambridge University Press. 1920. Pp. 247. 15s.

Dr. Savage does well to point out that few subjects are so often treated in text-books, both in a hackneyed and in an inaccurate fashion as food poisoning and food infections. The title "ptomaine poisoning" is still retained in some quarters years after it had been proved that it is both incorrect and misleading. The question was well summed up in a report to the Local Government Board for which Dr. Savage was chiefly responsible in 1913, when the medical officer of the Board, Sir Arthur Newsholme, wrote that the cases commonly known as "ptomaine poisoning" (products of food decomposition) are generally recognised to result from the presence in the food materials consumed of certain pathogenic organisms, which are either living and capable of active multiplication or which, although affected by the cooking, are, nevertheless, poisonous by means of the toxins contained in them. The term "bacterial food poisoning" thus came into being as more correctly describing this group of diseases. The public health services will heartily welcome this book, for, though a comparatively small volume, the author has included most, if not all, known causes of food poisoning. There are chapters dealing with chemical poisons in food, preservatives, foods inherently poisonous, food idiosyncrasy, and so forth. The book clears up many of the obscurities which have surrounded the subject, and a valuable sequel to Dr. Savage's careful studies will be found in the chapter on the prevention of food-poisoning outbreaks, and in the final chapter on methods of investigating such outbreaks. We have here a valuable adjuvant to public health administration.

THE LANCET.

LONDON: SATURDAY, JULY 10, 1920.

Medical Education and the Preliminary Sciences.

AT few, if any, of the Sections at the recent meeting of the British Medical Association was more important business transacted than at the Section of Medical Education. For, while in every other Section recent medical advances were being discussed along various divisions of our comprehensive work, and especially such advances as would prevent early disease in the community, in the Section of Education there was under debate how the class of men to carry on these large and responsible public tasks could best be educated. Professional knowledge serves little unless it can be transmitted to those who are to give practical effect to it. Sir CLIFFORD ALLBUTT, President of the Association, and Sir GEORGE NEWMAN, President of the Section of Education, alike indicated that the medical curriculum must be open to recurring revision, because on its scientific side we are dealing with ever progressive acquisitions of knowledge, while the environment in which this knowledge has to be applied is also ever changing, and particularly is changing in directions that must tend to make the activities of medicine more directly applicable to life at large. Such propositions are recognised as a commonplace by all society, while the fact that the existing medical curriculum in this country is without certain qualities necessary to train students to the best advantage is equally a commonplace with those who have studied the subject.

With this accepted information before them, and before their audience, five distinguished men delivered important speeches to the Section, and the substance of what they said will be found in our columns, while their full papers have been published in the Journal of the British Medical Association. The speeches of those who opened the discussion, as well as of those who joined in it, assumed that the revision of the medical curriculum, which is actually promised for an early date by the General Medical Council, will not lead to any time-extension of the course. But much pressure is being put, and legitimately put, upon the General Medical Council to give expression in the training of medical students to scientific and professional features which have hitherto been ignored, so that the dilemma is reached that, while by general consent the curriculum cannot be lengthened, many consider that it should include methods and directions of instruction which are now absent from it. It follows that the curriculum must be lightened at either end or both ends, so that the years spent in the medical school proper and in the wards, where the professional subjects, scientific and clinical, and the course of actual disease as it occurs in bulk, are studied, may not be trespassed upon either by the belated attention to the ancillary sciences or by the unnecessary intrusion of specialism. The tenour of the debate before the Section of Education revealed no dissent from the view that the professional period of medical study must be as uncomplicated as possible, if the medical student is to cover the course and obtain qualifications in any time like five years. The different speakers directed themselves towards explaining what they considered should be the relation of the sciences of chemistry, physics, and biology to the after events of the medical curriculum, in order that this preliminary scientific education, instead of being the industrious or idle cram that it often has been, should become the basis of the student's thoughts; so that throughout the study of the professional subjects scientific accomplishment and bias should assist the student at every turn in his acquisition of pathology and technique. From their words the ideal of early training in science emerged: namely, that it should be clear—and this postulates the good general education of the recipient—practically interesting, and formative. It should not lead to the detailing for examinations of so many boys in so many months knowing so many things in accordance with a syllabus; it should mean the sound preparation, by intelligent instruction in the essentials, of students who will be able to use what they have learned generally, in its special applications to all that may follow. Thus the philosophical conception of the pure sciences will arrive, and will be infused in the pathological work, giving intensive meaning to that work while also clarifying it.

It is clear that if the curriculum is to be strengthened without being lengthened, and simplified without being lowered in standard, the whole of the five years required by the State from the student must be used with the greatest economy. Having always in our eye the average student, we must admit that this can only be done if these five years are kept as clear as possible from the invasions of the unnecessary, while the students themselves must be sufficiently well educated to take full advantage of the opportunities for learning what is necessary. Their own time and the time of their teachers must not be wasted by finding in every class lads whose equipment does not fit them to understand the necessary courses of instruction. Every medical student to-day requires a good general preliminary education, and it is what a great many do not receive. Here is one definite thing which those who revise the curriculum must see to, for until this first impediment is removed early instruction in science is unduly hard, both for the pupils and the masters. If the students could come to their medical studies proper, whether at the medical school or under a University faculty, ready to attack anatomy and physiology, and having behind them an adequate training in chemistry, physics, and biology, the work to be done in the statutory five years would be enormously lightened. Can this substantial alteration in the curriculum, which has been proposed in different shapes for many years, be justified, implying, as it does, the use of the last year of schoolboy life, and perhaps even of two years, in preparing for medical studies proper? The General Medical Council may be inclined to solve the embarrassment of the overloaded curriculum in this way, but the proceedings in the Section of Education showed that such a solution, while expected, will be attended with many complications. There is at present in existence no large number of schools where the student can acquire that really practical knowledge of chemistry and physics which later should inspire and foster the whole of his medical work, and this we hold strongly should occur; while in the case of biology it is admitted that adequate training is offered by hardly any of the secondary schools. A practical

beginning in the revision of the curriculum—the improvement of general education being taken for granted—would be to leave chemistry and physics as schoolboy subjects, retaining biology as part of the medical course proper; and it would be understood that the lessons learned by the schoolboy in physics and chemistry would be called upon, and his knowledge in these directions developed by continuation study in connexion with his professional subjects. The suggestion has this practical force behind it that chemistry and physics are the groundwork of all scientific education, and whatever the schoolboy who intends to make his career dependent upon scientific knowledge may elect to do, complete familiarity with these sciences will be required of him. Biology is to this extent different, that it forms a definite introduction to the pursuit of medicine. A resolution embodying this change in the curriculum was set down at the Section of Education, and will be brought to the notice of the Education Committee of the General Medical Council.

The Wassermann Reaction.

THE complement-fixation test in syphilis has proved, and is likely for some time to prove, of more far-reaching importance than its discoverers can have imagined. When WASSERMANN, NEISSER, and BRUCK in 1906 published the fact that the complement-fixation test could be applied in syphilis there was no reason why they should not have regarded it merely as a special application of the Bordet-Gengou reaction, in which complement was used up in the interaction of specific antigen with its specific antibody. From the standpoint of diagnosis in syphilis Wassermann's reaction has amply fulfilled the expectations of its originators. How accurate it has become in the hands of expert workers was shown in a recent Report issued by the Medical Research Council (Special Report Series, No. 21) recording an experimental trial, in which more than 100 sera from cases of known syphilitic or non-syphilitic nature were examined by three separate workers of repute, with results which were astonishing in their concordance with one another and with the known clinical facts. The test, as all our readers know, has become a routine part of diagnosis, and there is no need to enter here into any discussion of its merits from this point of view. The only doubtful questions concern the precise manner in which it is best carried out. But there is another and much wider aspect opened out by Wassermann's reaction, one that in the long run may, we think, prove of even greater importance than the mere diagnosis of a specific disease. The grounds on which WASSERMANN and his colleagues based their experiments were rigidly scientific. In accordance with the observations of BORDET and GENGOU, they deemed it necessary to use as antigen an extract of syphilitic liver, and they assumed that a positive reaction meant the presence of specific antibody in the blood of the patient. But it was soon found that the specific antigen was unnecessary. An alcoholic extract of normal liver or heart, even from a guinea-pig, was found to serve just as well, and, indeed, solutions of known chemical composition—e.g., of lecithin and cholesterin—were proved capable of acting as antigen, and this without any impairment of the diagnostic value of the test. We know of no other instance in which a reaction of this sort has suffered the wreck of its assumed scientific basis and become a frankly empirical test without at the same time being proved invalid. It was not to be supposed that scientific men would tolerate such a shock to their principles, and it became necessary to search for other scientific grounds on which to base an explanation of the phenomenon. The bio-chemists have been at work, and for the first time in the history of immunology it seems possible that an intimate serological problem may ultimately receive a physico-chemical explanation. We are, doubtless, a long way from this at present, but much has been already accomplished, and if study of the Wassermann reaction should lead to so happy a result the test will acquire a significance far transcending that of its diagnostic value.

We have been prompted to these remarks by the receipt from the Ministry of Health of a Report on the Complement-fixation Test in Syphilis,[1] which merits the careful attention of those of our readers who are interested in the scientific side of serological problems. From the nature of the subject it is not light reading; much of it, indeed, is difficult reading, save for the expert, as we doubt not it was difficult writing. But it contains a large amount of patient and valuable research and of deep and original criticism. In a short introduction Colonel L. W. HARRISON explains the origin of the work contained in the Report. It was a scheme, interrupted by the war, for a prolonged research into the properties of the various ingredients in the Wassermann test in order to improve, if possible, the technique of the reaction. The work has been carried out by Dr. F. GRIFFITH and Dr. W. M. SCOTT at the laboratories of the Ministry of Health, under the general superintendence and advice of Colonel HARRISON. It has been proceeding since July, 1917, and the Report by Dr. GRIFFITH and Dr. SCOTT contains a mass of valuable observations which, in their opinion, suggest certain improvements in the method of carrying out the Wassermann test. As everyone is aware, most persons react to the test in a frankly positive or negative manner which admits of no cavil. The difficulties arise in the so-called border-line cases, in which the reaction is a weak one. There is in normal sera a small but variable amount of the substance, or property, which reacts with the antigen, and the problem is so to balance the ingredients in the test as to exclude these, while making the test sufficiently delicate to detect real syphilitics. This cannot, of course, be done absolutely, but all techniques have as their aim as close an approach to this ideal as can be achieved. As a result of their work Dr. GRIFFITH and Dr. SCOTT put forward a technique, which is supported in detail by their experiments, and of which the two chief principles are: (1) A very highly diluted antigen, consisting of the acetone-insoluble fraction of the organ-lipoids dissolved in alcohol, to which is added a suitable dose of cholesterin; for use, the alcoholic solution is rapidly diluted with normal saline to 1 in 640. (2) The second principle consists in prolonged fixation in the ice chest for 18 hours, instead of at room temperature or 37° C. This is an application of the observations of DEAN and of SMITH and MACNEAL. A further principle adopted is that of maximum sensitisation of the corpuscles, with only a moderate dose of complement, which is kept constant. The method

[1] Reports on Public Health and Medical Subjects. No. 1. 1920. Price 5s.

is favourably reviewed by Colonel HARRISON in his introduction, but space forbids our entering into further discussion of it here. The remaining and longer portion of the Report is occupied by a critical review of the principles involved in the Wassermann test by Dr. ARTHUR EASTWOOD. Only those who have attempted to grapple with the vast literature which has sprung up on this subject, and know its highly technical and controversial nature, can appreciate what Dr. EASTWOOD has done in preparing this review, which is probably the most impartial, as it is the most complete, in the English language. It is divided into two parts, the first dealing with "Complement," and the second with the so-called "Wassermann Substance." The writer does not attempt to put forward any theories of his own; his work lies in a candid statement of the various points at issue, with the answers propounded by the different workers who have written about them, the evidence being given in each instance and its validity critically considered. At the present day no final answers are possible, and the method adopted by Dr. EASTWOOD is clearly the best and most useful which he could have chosen. All serological workers will owe him a debt of gratitude for the conscientious way in which he has performed a laborious task, and for the critical acumen which he has brought to bear upon it. Anyone who is in search of a subject for original research will find abundant suggestions here.

We should like to be allowed, in conclusion, to congratulate the Ministry of Health on this the first report of the kind which it has issued, and to express the hope that it may be succeeded by many others of equal value and importance. Work on such lines is precisely that which can best be carried out in the laboratories of a Government institution. We noted the other day in the public press a singularly ill-informed outcry of "waste," because Reports on the Wassermann test had been published by two separate Government departments. The particular piece of research recorded in the present Report was not only carried out, as will be understood from Colonel HARRISON'S introduction, with the full knowledge of the Medical Research Council, but was designed to fill certain gaps in knowledge which the Reports of that Council had emphasised. It was evidently carried out in the laboratories of the Ministry of Health because it could be done better and more economically there than elsewhere.

The Position of General Practice.

Dr. PETER MACDONALD, of York, described the debate on the future of medical practice, held by the British Medical Association at Cambridge on Friday of last week, as one of the most valuable ever instituted by any medical body. Probably it was one of the most enlightening. For no doubt many general practitioners came to it with grave misgiving as to the part which the State is preparing to take in moulding the outward form and conditions of medical practice, and were reassured by the emphatic utterance of the Chief Medical Officer of the Ministry of Health, "Nationalisation of the medical profession—it simply cannot be done." Sir GEORGE NEWMAN went on to speak of the action of the State in continuing to pile up duties—under Public Health, Education, Mental Deficiency, Children, Midwives, and other Acts—on a doctor who can never be organised in any strict sense, on a profession the whole genius of which is individualistic. Although safeguarding his Department by assuring his audience that he was speaking wholly in an unofficial capacity, it yet seems quite clear that so long as Sir GEORGE NEWMAN is principal medical adviser to the Ministry of Health and to the Board of Education nothing will be done to abolish the personal relations now existing between the general practitioner and his patient. Behind these relations lie a long history and sound reason.

But some change there must be, for it is clear that the two contracting parties, the State and the medical profession, cannot be allowed to drift into a position of misunderstanding. The State has become conscious, as never before, of the community's need of the medical profession, and the medical profession is aware of new obligations, not merely those imposed by statute, but others, the result of social and economic factors hitherto regarded as scarcely coming within the range of medicine. Adjustments are needed, and in many ways a closer relation between the State and the general practitioner, who should maintain nevertheless all that is of permanent value in his relation to his patient. Dr. ALFRED LINNELL, speaking in the discussion from the standpoint of that most general of all general practitioners, the man in rural practice, regarded the primary health centre as the pivot around which the new medicine is to turn. Provided with greater facilities to study and find out the beginnings of disease, and to treat them efficiently when discovered, and paid well enough so as to have no need to rush his work, the general practitioner in these circumstances will remain not only the essential humaniser in medicine, but, as he already is, the chief agent of preventive medicine. The growing disposition at the Ministry of Health to take the general practitioner by the hand and help him in his work was acknowledged in the discussion.

The debate was necessarily scrappy. Five medical men, moving in five distinguished spheres of medical endeavour, were prepared with addresses, each on a special aspect of the subject, and each contributor was heavily weighted with new thoughts and ideas. Sir GEORGE NEWMAN spoke for the State, Sir WILMOT HERRINGHAM for the consultant, Dr. LINNELL for the rural practitioner, Professor F. GOWLAND HOPKINS for medical research, Mr. E. W. MORRIS for the hospitals from their institutional aspect. It would take much ingenuity to dovetail all that was said into a workable scheme. But none of the speakers had any thought of abolishing general practice or of altering in any essential way the relation of practitioner to patient. Only Mr. Alderman JENKINS, the Secretary to the Health Committee of the Labour Party, spoke of a State service, but then in the same breath he indicated that he did not desire to see medical men "civil servants in the sense in which we think of them." The medical service which he had in mind would study the conditions under which workers live and work, and would educate them in the safeguarding of their health. That is what we should all like to see. The outstanding message of this debate is that general practice, extended and sublimated, remains for our generation upon its long-tried and noble plan; it remains as a career for the brightest and best of students to enter.

Annotations.

"Ne quid nimis."

INTERNATIONAL PUBLIC HEALTH.

THE Medical Advisory Board of the League of Red Cross Societies is holding its first meeting at Geneva this week. We enumerated its 15 members in our issue of June 5th and need only repeat here that the representatives from this country are Colonel S. Lyle Cummins, Sir Walter Fletcher, and Sir George Newman, and that the other delegates are equally distinguished. The public health problems of Asia and Africa have heretofore often appeared immense and baffling; it is now the health of Europe which is the white man's most pressing burden, and the attention of a continent will be concentrated on the deliberations going on by the side of Lac Léman. The opportune moment has been utilised for the appearance of the first number of the *International Journal of Public Health*, published bi-monthly by the League in four editions—English, French, Italian, and Spanish. Dr. Thomas R. Brown is the editor, with a staff of one associate and six assistant editors under him. The first three numbers are to be issued gratis in all parts of the world, and with the fourth issue in January, 1921, a subscription rate of 20*s*., or its equivalent of 5 dollars, 25 francs or lire, will be instituted. The scope of the journal is apparent when it is noted that this pioneer number includes as its first original article an essay by Professor A. Calmette on the protection of mankind against tuberculosis, part of a report by Dr. Richard P. Strong on the antityphus campaign in its bearing on Poland, and a sketch by Dr. George C. Whipple of the possibilities of world sanitation in the twentieth century. The contributions contain brave words which need bold administrators to carry them out.

THE MENTALITY OF JUVENILE ADULT DELINQUENTS.

THE problem of the connexion between criminality and mental deficiency bristles with difficulties whatever be the aspect, social, legal, or medical, from which it is approached. Reports, both of expert individuals and of commissions appointed to deal with the subject, are at the disposal of those who seek general principles for application in practice, but no definite body of doctrine is yet available nor is likely to be until more data have been collected. The general trend of opinion to-day is setting towards the indispensability of psycho-physical examination of each individual delinquent, an attitude preferable to any sentimentality or unthinking humanitarianism on the one hand, or to the unvarying application of an inelastic legal "yes-or-no" criterion of insanity or mental deficiency on the other. The youthful offender may look like an angel and act like a demon, but neither looks nor acts suffice for a diagnosis. In the case of the adult, pilfering or thieving may be the expression of definite organic conditions, such as early general paralysis, alcoholism, or morphinism, as well as the outcome of moral or mental deficiency unaccompanied by any obvious structural or toxic change; there is evidence to suggest that in the case of women kleptomanic outbreaks are frequently associated with the menstrual or premenstrual period, and Glueck has recorded a case in a male where theft seemed to be a form of perverse sexual gratification. Persistent lying, similarly, in the form of pseudologia fantastica, may be a symptom of actual cerebral disorder, no less than one of the phenomena by which the criminal evidences his antisocial outlook.

If, then, it is granted that individual symptoms customarily regarded as of a pronounced antisocial cast may be ascribed on occasion to structural or toxic disease, we are bound in any assessment of criminality to take cognisance of the subject's physical and psychical make-up, a matter not to be decided by a brief interview with the criminal, but necessitating a prolonged, tedious, and painstaking investigation. To assign criminal traits to heredity or to environment is too ready-made a solution to be of value. Dr. John M. Ahern, medical officer to the Borstal Institution, records elsewhere in this issue the results of an inquiry into the mentality of the inmates of that reformatory, conducted during February and March of this year, an inquiry of the kind which is essential if any progress is to be made. Only some 10 per cent. of the 928 juvenile adult delinquents came under the category of the mental defective, though Dr. Ahern considers this a very conservative estimate, ignoring as it does borderline cases and slighter yet unmistakable degrees of mental deficiency. Intellectual defect is probably of least significance in connexion with the criminal propensities of the subject; degree of criminality and level of intellectual attainment show no correspondence, for the village idiot, Dr. Ahern reminds us, may be amiable and inoffensive. It is a nice point, however, whether intelligence and intellectual attainment are strictly synonymous. The actions of many criminals show a high order of cleverness yet but a low order of intelligence, for the latter connotes the ability to apply knowledge and to profit in the school of experience. Now Dr. Ahern makes the shrewd observation that continued misconduct, if it be of a purposeless character, is always suggestive of mental defect; the habitual offender is dull to his own interests, however brilliant a rebel he may fancy himself; he has not the wit to appreciate the strong inducements to good conduct that are to be found in a Borstal institution. The same is true, doubtless, of the adult criminal; a career of crime implies inability to realise the inevitable consequences.

It is difficult, in a way, to separate the emotional from the intellectual factor in mental defect associated with criminal tendencies, since emotional outbursts may have their origin, as Dr. Ahern says, in some idea of "getting one's own back." Unreasoning, meaningless, emotional overflow may fairly be regarded in some instances as an epileptic equivalent, and this is especially true of violent temper, which has been shown statistically to be frequent in epileptic families. In other cases the emotionally unstable are plausible, well-spoken, generous, and of good behavour under rigid supervision, and there are great differences in the way in which the defect is manifested, with corresponding difficulty when it comes to the question of certification. It might be supposed, legitimately enough, that the physiological disturbances of adolescence will account, in part at least, for the emotional instability of the youthful delinquent, and that with the establishment of neuro-glandular equilibrium emotional balance will likewise be attained, but too much reliance can be placed on this hope. Many criminals remain at the level of children as far as their affective life is concerned; they become the catspaws of stronger minds than their own. All observers are agreed on the seriousness of the problem presented by their treatment, institutional or otherwise. If their general level of intelligence is fair, as is often the case, it should be possible, in some instances, to strengthen control by suitable psychological re-education, and in others glandular therapy, where indicated, might well be given a trial. No line of therapeutic approach should be vetoed because of mere novelty or frank empiricism, as long, that is, as there is evidence of actual psycho-physical imperfection. In any case, the results obtained by the Borstal system indicate that for very many youthful criminals who are not too much below par mentally and physically the outlook is hopeful enough, provided medico-psychological investigation and treatment are given as ample chances as the nature of the human material demands.

MEDICAL SECRECY IN FRENCH LAW.

A CASE has just been heard on appeal in a French higher court which raised very pointedly some of the questions of professional secrecy so closely discussed at the Representative Meeting of the British Medical Association. The Eighth Chamber of the Paris Court of Appeal was asked to decide on the right to produce in court a confidential medical certificate.

A certain Monsieur X appealed for a divorce from his wife, producing in support of his action a doctor's certificate on which his lawyer laid great stress. The Court of Second Instance as well as that of First Instance decided to disregard this certificate, since professional secrecy did not allow a doctor, without the patient's knowledge and consent, to deliver a medical certificate to a third person, even should that person be her husband. The production of the certificate was held by the court to be a serious injury, and the suit was decided in the wife's favour. The decision confirms once again the legal position long ruling in France. For a doctor to supply a certificate containing facts, of which he has only come to a knowledge in professional circumstances, constitutes a lapse from the duty of discretion imposed upon him by law. No such certificate is admissible as evidence in a French court of law.

EPSOM COLLEGE.

Epsom College is passing through a period of financial stress which is a source of anxiety to its promoters and of obstruction to the smooth working of the institution. The annual report of the Council presented to the governors on June 25th shows a deficit of £4425 incurred during the year 1919. This is accounted for mainly by the need for extensive repairs, which had accumulated during the war, by the higher salaries paid to masters and officials, and by increased establishment and catering charges. Some of the additional expenses will be met in the future out of increased school fees payable from next September. Sons of medical men will then have to pay 100 guineas, others 120 guineas, and day boys 40 guineas, against the former charges of 70, 80, and 25 guineas. The sum of £6000 will shortly have to be repaid to the mortgagees, while interest on the remaining £8000 of the mortgage must be raised from 4½ to 5 per cent. In view of all these facts the Council has decided to create mortgage debenture bonds of £100 each on the security of the College lands and buildings, in order to pay off both mortgage and banker's loan. Friends of the College are asked to take up these bonds. The double purpose of assisting in the provision of a public school education to sons of medical men at reduced fees, and of affording financial support to necessitous doctors, their widows and families, should commend itself to all members of the profession. The war record of old Epsomians and masters—to be memorialised in a reconstructed nave to the chapel, for which the fund is not yet closed—is sufficiently distinguished to add to the school's claim for turning out the right sort of men, and its present needs appear modest enough to command a speedy release from embarrassment.

THE TREATMENT OF ACUTE INFECTION OF THE KNEE-JOINT BY ACTIVE MOVEMENT.

"Everything that is universally accepted as true in surgery is invariably false." These are not, as might be supposed, the words of one of the caustic critics of our art, whom, from Molière to Bernard Shaw, we have always with us, but of one of its greatest exponents. They refer to the accepted treatment of tuberculous, rheumatoid, and other forms of arthritis by rest, which Sir W. Arbuthnot Lane stated recently in our columns[1] can often be benefited by allowing active movement, if sufficient extension can be exerted to take pressure off the opposing articular surfaces. During the war a Belgian surgeon, Dr. C. Willems, Director of the Hoogstade Military Hospital, had the courage to go even further and treat acute arthritis, principally of the knee, due to infected bullet wounds, by incision and drainage, followed by immediate active movement. The movement expelled pus and prevented adhesions, and the results were excellent. In the *Boston Medical and Surgical Journal* Dr. F. B. Lund has reported the following case treated by this method. A man, aged 43 years, received a bullet wound in the right popliteal space on Dec. 7th, 1919. The X rays showed a flattened bullet in the back of the knee-joint. On Dec. 11th the temperature was 100° F., the skin was reddened, and there was evidence of fluid in the knee-joint. On the 12th a 1½-inch incision was made on either side of the patella, and a large amount of seropurulent fluid escaped. A 3-inch incision was made in the middle of the popliteal space, and the dissection carried down to the inner side of the popliteal vessels. After considerable difficulty the bullet was found in the capsular ligament projecting into the knee-joint. A rubber tissue drain was placed in the popliteal space and a dry dressing applied. Active movement was begun next day. The patient coöperated very well and was proud of the amount of movement of his damaged leg. The movement was regularly continued daily, the temperature rising gradually until on Jan. 3rd a collection of pus in the upper part of the popliteal incision was drained by insertion of forceps and a rubber tube was inserted. On Jan. 9th another pocket of pus was opened. At this time active movement was not so free as it had been on account of swelling and tenderness in the popliteal space. The Carrel-Dakin treatment was then adopted and the amount of pus diminished. Active movement was continued, but not to the same extent, and on April 1st he was up on crutches with 45° of flexion and perfect extension. He was discharged with perfect movement of the joint. Of the value of the active movement there could be no doubt, though recovery was delayed by the complication of abscess in the popliteal space. Considering the permanent stiffness of the knee-joint which usually follows suppuration the recovery was remarkable. In the *Annals of Surgery* for September, 1919, McWilliams and Hetzel state that in 73 cases of war wounds of the knee-joint 16 became infected. Of 12 of these, in which the final result is known, amputation was performed in 3, resection in 1, 4 resulted in ankylosis, and 4 were fatal. These cases were treated by the old methods. The writers believe that the treatment of Willems would have given much better results. In 100 cases, of which 18 were accompanied by purulent synovitis of a virulent type, chiefly streptococcal, he had no deaths and no amputations. There was 1 resection and only 2 stiff joints.

[1] THE LANCET, May 29th, p. 1159.

FINANCIAL DIFFICULTIES OF IRISH HOSPITALS.

IN our last issue reference was made to the serious financial position of the Royal Victoria Hospital, Belfast. Our Irish correspondent now writes: I am glad to be able to state that on July 1st at a meeting of the Working Men's Committee held in that institution it was decided that as 1*d.* weekly was no longer an adequate contribution from the employees the amount in future should be at least 2*d.* a week from men and 1*d.* from women, girls, and boys. It was also passed to ask employers to deduct workers' subscriptions from their wages. It remains for the employers now to follow the example set by their workers. At present interest from investments supported 56 beds; general subscriptions from manufacturers, the Hospital Saturday collections and charitable donations maintained 65 beds; and the working classes' subscriptions 96 beds. The latter had increased from £5076 in 1915 to £12,500 in 1919, and it is needed that they should further grow to £20,000. The total cost of the institution had increased from £14,741 in 1914 to £38,409 last year, the principal items being: dietary, £5000 to £14,000; nurses' salaries, £13,038 to £24,078; ordinary salaries, £2014 to £4060; medical and surgical requisitions, £2400 to £4844. The extra wards brought into use during the war now cost an additional £12,000 a year. The Maternity Hospital, Belfast, the main training institution in that city for students and midwives, is also experiencing financial difficulties, due to increased cost of almost everything. As, according to the estimate of the Ministry of Health, there should be one maternity bed per 2000 population, Belfast on this ratio should have 250 beds; it has, however, only 70; and if a line be drawn across Ireland from Dublin to Galway, Belfast is the only place north of this line that has any maternity institutions except in workhouses, some of which are admirable,

and are recognised both by the Central Midwives Board for Ireland and by the Queen's University of Belfast as places where both midwives and medical students may obtain practical training.

A report by Sir Francis Champneys just published, dealing with the answers received from a large number of medical schools on practical midwifery, and presented to the General Medical Council at its last sittings, runs thus: "The immediate provision of beds in sufficient number to supply the needs of our medical students is probably impossible. The utilisation of beds in Poor-law institutions might help." The Education Committee recommended that steps may be taken for the utilisation of existing Poor-law lying-in institutions for clinical instruction. This wise suggestion was adopted by the General Medical Council so far as England and Scotland were concerned, but was omitted in the case of Ireland; and now it is found such an omission would not be justified. Only this week, at the clinical practical examinations in midwifery of the Queen's University of Belfast, a large batch of students were examined at the very commodious Maternity Hospital of the Union Workhouse, Belfast; and without this place (owing to the large number of students for the M.B. Final Examination—66 in all) a number could not have been examined practically. The sooner omission of Ireland from the suitable recommendation of the Education Committee of the General Medical Council is abrogated the better in the interest of both medical students and midwives. It is all very fine to talk of the stigma of Poor-law institutions, but what is yet supplied to replace them? The unusual number of medical students and of pupil midwives must be provided with practical midwifery instruction in the present emergency, and, to do so, workhouse lying-in wards are urgently required in Ireland, and must be made available as in England and Scotland.

SOLUTIONS FOR INTRAVENOUS INJECTION.

THE Medical Research Council have arranged to place on the market sterilised solutions of gum acacia like those extensively used in military hospitals during the war in the treatment of hæmorrhage and shock. It is believed that the experience of the war will have created a demand for these solutions for the purposes of civil surgery, but that many hospitals have been unable to undertake the manufacture of the solutions in their own laboratories. The solutions are made according to the method employed during the war at the Base Hygiene Laboratory, B.E.F., as described in the Medical Research Council's Special Report, No. 25. They are made up in special stoppered bottles containing 500 c.cm., and are sold at the price of 1*s.* 6*d.* per bottle, plus a charge for transport; 6*d.* is also charged for each bottle not returned when empty. All inquiries should be addressed to Messrs. Evans, Sons, Lescher and Webb, Ltd., at the Bacteriological Research Laboratories, Runcorn.

MYCOTIC OTITIS.

ACCORDING to Dr. C. J. Koenig,[1] oto-rhino-laryngologist to the American Hospital of Paris, mycotic otitis, though well known, is not of very frequent occurrence. He records a case in a woman, aged 27, with cicatrised pulmonary lesions supposed to be of tuberculous origin, who had been treated for eczema of the right external auditory meatus, followed by tinnitus, itching, and deafness. On inspection the meatus was found to be full of greyish masses of what appeared to be macerated epithelial debris, on removal of which the drum was seen to be perforated at its antero-inferior segment. After treatment by catheterisation of the Eustachian tube, syringing the meatus, and instillation of alcohol and peroxide, the perforation closed, the canal became normal, and the hearing returned. As the symptoms recurred within a few weeks on two subsequent occasions the greyish masses which had been taken for macerated epithelium were examined and found to be intricate meshes of mycelium containing spores. Cultures of the ear on Sabouraud's medium showed a typical growth of *Aspergillus niger*, which of all inferior moulds is the one which develops most frequently in the external auditory meatus. Dr. Koenig suggests that the previous affection of the lung was not due to tuberculosis, as had been supposed, but to aspergillosis, inasmuch as pulmonary mycosis is apt to simulate tuberculosis, and the sputum in such cases shows acid-fast bacillary forms resembling Koch's bacilli.

[1] Medical Record, June 5th, 1920.

EMERGENCY DISTRIBUTION TO LONDON HOSPITALS.

THE Hospital Fund for London, associated with the name of King Edward, has just distributed £250,000 to meet the immediate and pressing needs of the London hospitals. The grants are made with the express object of assisting the hospitals to carry on their work, and in the hope that where special difficulty is being found in raising funds for maintenance, the grant may afford the hospital authorities an opportunity of considering the best methods for improving their financial position. The grants are from £25 upwards, in accordance with the size of the hospitals and the special circumstances of their needs. Those of £1000 or over are as follow:—

Bolingbroke Hospital, £1500; Charing Cross Hospital, £2100; City of London Hospital for Diseases of the Chest (Victoria Park), £3000; Dreadnought Hospital, £1000; East London Hospital for Children, £3000; Elizabeth Garrett Anderson Hospital, £1250; Great Northern Central Hospital, £12,000; Guy's Hospital, £7000; Hampstead General and North-West London Hospital, £2000; Hospital for Consumption, (Brompton (including Sanatorium at Frimley), £3000; Hospital for Epilepsy and Paralysis, £1200; Hospital for Sick Children (Great Ormond-street), £8000; Hospital for Women (Soho-square), £2000; King's College Hospital, £17,500; London Homœopathic Hospital, £3500; London Hospital, £35,000; London Lock Hospital, £1000; London Temperance Hospital, £3500; Metropolitan Hospital, £11,000; Middlesex Hospital, £10,000; Miller General Hospital for South-East London, £4000; National Hospital for the Paralysed and Epileptic, £8000; Passmore Edwards Hospital for Willesden, £1000; Prince of Wales's General Hospital, £7000; Queen Charlotte's Lying-in Hospital, £2000; Queen Mary's Hospital for the East End, incorporating West Ham and Eastern General Hospital, £6000; Queen's Hospital for Children, £6500; Royal Chest Hospital (City-road), £1000; Royal Free Hospital, £6000; Royal London Ophthalmic Hospital, £3000; Royal National Orthopædic Hospital, £2000; Royal Waterloo Hospital for Children and Women, £2000; St. George's Hospital, £8500; St. Mary's Hospital, £2000; St. Mary's Hospital for Women and Children, Plaistow, £1500; St. Thomas's Hospital, £12,000; Samaritan Free Hospital for Women, £1500; University College Hospital, £10,000; Victoria Hospital for Children, £1500; West London Hospital, £9500; Wesminster Hospital, £9500; the remaining grants to 64 smaller hospitals totalling another £18,000.

In allotting the grant the Council of the Fund is asking each hospital to consider whether its income can, without detriment, be increased by taking some special steps—e.g., by the organisation of contributions from employers or from employed, or from patients who can afford to pay, or by other methods; and at the same time to take whatever steps may be necessary and practicable to keep the expenditure within the available or prospective income—e.g., by postponing bed extensions and by exercising more stringent control over cost of working.

PURPURA ANNULARIS TELANGIECTODES.

ACCORDING to Dr. Ludwig Weiss,[1] of New York, who records two examples with the biopsy findings in one case, this condition was first described by Majocchi in 1896. It is characterised by grouped or annular lesions, associated with pigmentation or discoloration and no thickening, but a tendency to atrophy. Three stages in the disease may be distinguished—a telangiectatic, a hæmorrhagic-pigmentary, and an atrophic. There are no inflammation, pain, fever, or other constitutional symptoms observable as in other purpuric conditions. As regards the ætiology of the affection, almost all diatheses have been suspected, only to be

[1] The Archives of Dermatology and Syphilis, May, 1920.

excluded, such as tuberculosis, syphilis, rheumatism, gout, diabetes, heart disease, hæmophilia, and lead poisoning. Out of 38 cases collected by Mackee in 1915, 31 occurred in the male sex. Auto-intoxication is regarded by most authorities as the causative agent, but until this is definitely established the treatment can be only symptomatic. Rest and an elevated position of the limb, with the use of embrocations of Burow's solution, will prove useful. Calcium lactate may be given to increase the viscosity of the blood, and later strychnine and arsenic should be administered. The use of a porous bandage without rubber, to exert an even pressure, has also been recommended.

THE HOSPITAL SURVEY.

Sir Napier Burnett has now presented to the Red Cross Joint Council a survey of the financial position of the voluntary hospitals throughout Great Britain and Ireland for the five-year period 1914–19. His inquiry was directed to ascertaining the total amount of ordinary income and expenditure for each of these years, along with the total value of legacies not earmarked for specific purposes. The conclusions to which he comes, stated baldly, are that the voluntary hospitals in this country, taken as a whole, are solvent; that there is a deficit on the five years running of about a quarter of a million pounds for the provincial hospitals (and a similar sum in London); and that a further sum of three-quarters of a million is required to meet the accumulated cost of repairs and necessary alterations in both metropolitan and provincial hospitals. A covering letter from Sir Arthur Stanley states that if the voluntary system is to continue, five things are necessary:—

(1) Payment of war debts, preferably by existing voluntary organisations, or, failing that, by a grant from the Exchequer.

(2) The extension of the almoners' system, under which a contribution towards their maintenance is requested from those patients who can afford to make it.

(3) The organisation of systematic collections from workpeople and employers of labour.

(4) The establishment of a competent authority to examine hospital accounts and consolidate appeals.

(5) Closer coöperation with the Poor-law infirmaries in which there is a large number of vacant beds that might be utilised to relieve the pressure on existing voluntary hospitals.

We shall take an early opportunity of commenting on the figures from which these important conclusions are drawn.

IMMEDIATE SELF-DISINFECTION AND THE MINISTRY OF HEALTH.

AN influential deputation from the Society for the Prevention of Venereal Disease was received by Dr. Addison, Minister of Health, on July 2nd, when Lord Willoughby de Broke submitted the following resolution:—

"That inasmuch as the Ministry of Health has failed, and public bodies, including the London County Council, have declined, to provide the means of delayed disinfection against venereal disease at ablution centres, this meeting calls upon the Ministry of Health and upon local authorities to instruct all qualified chemists to sell such means of immediate self-disinfection against venereal disease as may be approved from time to time by the Ministry of Health or by medical officers of health.

He added that while everybody was agreed that all the influence of research and administration ought to be applied to the prevention and cure of venereal disease, and that all means of moral prevention ought to be constantly employed, especially with regard to the youth of the nation, the society which he represented was addressing itself to the efficacy of immediate self-disinfection, and the policy it recommended was that the Ministry of Health should take such steps as would educate the public in the whole hygiene of this important subject. Captain W. E. Elliot, speaking as a medical Member of Parliament, said that the House of Commons was intensely interested in the prevention of venereal disease, and felt that unless stronger arguments could be brought against it than had hitherto been the case, it could not continue to accept the responsibility of prohibiting the sale of disinfectants which had the approval of the medical profession. Dr. J. H. Sequeira stated that the number of new male patients, mostly ex-soldiers, suffering from syphilis, admitted for treatment at his clinic at the London Hospital in 1919 was 90 per cent. above the number attending in 1918, and that there was an increase of 15 per cent. in the total of female patients. The increase in cases of ophthalmia neonatorum and lip chancres proved that there was a definite increase in venereal disease, and that increased attendance at clinics was not merely the result of the spread of knowledge of these diseases amongst the people. Sir Archdall Reid stated that about 40,000 men passed through his hands during the war, and up to 1917 there was a vast amount of syphilis. In the beginning of January, 1917, a policy of immediate self-disinfection was advocated among the troops under his command, with the result that venereal disease practically disappeared. Mr. Wansey Bayly said that 14 borough councils, including West Ham and Holborn, in the metropolitan area, had adopted the policy of the society, and that the National Birth-rate Commission in its last report had expressed the opinion that the methods for the prevention of venereal infection by immediate self-disinfection should not be withheld from the public. Dr. A. Mearns Fraser reported his success in inducing the public at Portsmouth to accept the principle of immediate self-disinfection. Dr. C. W. Saleeby, Lady Askwith, Sir William Arbuthnot Lane, and Sir James Crichton-Browne also spoke.

Dr. Addison, in reply, said that they did not really know whether venereal disease was increasing or not, because they had no data supplied of a properly ascertained scientific kind. They knew that there was a great increase of people attending centres or clinics. The propaganda of the society represented by the deputation and the general public enlightenment were perhaps bringing people to realise that they must be properly treated. At all events, they had not got a basis of ascertained fact on which it was quite safe to dogmatise. It was suggested that the Ministry should issue certain instructions to local authorities and to the public, and he pointed out that it would be necessary to have an overwhelming case to justify such action and to avoid the conflict of opinion. They would have to contend with a great wave of public feeling which would suggest that the Government was really encouraging vice. It had been urged by the deputation that their suggested policy would be successful if scientifically and thoroughly done. That might be a true statement. They could not however, deal with a population of 40 millions on the same basis as Sir Archdall Reid, with iron discipline at his command, could deal with 2000 soldiers at one time. That was quite different from placing something at the disposal of any citizen with certain instructions as to use. They had to have a very strong case that would meet the intense and vehement opposition which such a proposal would arouse, and if they were not successful it would put the whole movement back a generation. There would be great objection raised, and he thought they must admit that a great deal of it would be well founded. To adopt such a proposal towards the population as a whole—boys and girls, men and women—would be held, and he thought with material ground, as doing something which would tend to encourage people to run risks. Last year he appointed a very strong body of men, who had reported to him that certain drugs, if properly applied, were efficacious, but if these drugs were not properly or scientifically applied their efficacy could not be relied upon. They also reported that the use of such drugs gave rise to a false sense of security and encouraged the taking of risks, and that, in spite of the most careful instructions, the issue of packets to soldiers resulted in men who used them for self-disinfection still having infection. Could they rely, he asked, on the general public properly and scientifically using those things? Two experimental centres had been established under the Manchester corporation, and so far the results were encouraging. Those experiments in Manchester were being watched with anxiety. He assured the deputation that the Ministry was anxious to take any practical measures they could thoroughly

recommend for the prevention and treatment of the disease, and they were quite prepared, if they were certain of good results, to face novel methods.

CHARLES MAYO AND THE AMERICAN HOSPITAL IN LONDON.

A DINNER was held at Claridge's Hotel, London, on Tuesday evening last, with the double object of paying a high compliment to Dr. Charles H. Mayo, the famous American surgeon, of Rochester, Minnesota, and of introducing to public notice the movement, rapidly advancing from theory to realisation, for founding an American Hospital in London. The hosts at the dinner were the President, Lord Reading, and Governors of the projected American Hospital, and the two toasts of the occasion were the health of Dr. Mayo, which was proposed by the Chairman, the Lord Chief Justice of England, and "Prosperity to the American Hospital in London," which was proposed by Mr. Balfour. Lord Reading disclaimed any ability to describe to an audience, comprising so many medical men, Dr. Mayo's professional position or the performances by which he had attained thereto, but dwelt on the fact that between the two great English-speaking peoples the inevitable links of race and language must be enormously strengthened by the interchange of scientific knowledge. Dr. Mayo gave a sympathetic sketch of what true intellectual union between England and America might achieve, and concluded a blood-curdling forecast of what war in the future would mean by stating that medical preparation to combat wholesale scientific destruction ought now to be made. Mr. Balfour, in wishing all good fortune to the American Hospital in London, concentrated upon the value of mutual understanding between America and this country on questions of medical science. He claimed, amid protests, to be the oldest man in the room, and having shown what enormous progress in medicine his span of years had witnessed, prophesied that this rate of progress would be accelerated in the future. He asked what could more surely assist to this desirable end than a practical exchange of their experiences between professors, teachers, practitioners, and even students of the two countries, such as could only be got by personal conference, and could never be supplied by any written medium. The toast was responded to by the American Ambassador and Sir Arbuthnot Lane. The American Ambassador rejoiced to know that London would soon possess an outward and visible sign of the graces of friendship and hospitality invariably extended by London to American visitors, and Sir Arbuthnot Lane then gave a rapid sketch of the activities which have culminated in the foundation of the American Hospital in London. The original idea of the institution he attributed to Mr. Philip Franklin, and he showed how on both sides of the Atlantic that idea had quickly taken root and had been developed by the energies of prominent citizens, medical and lay, until now a great institution was arriving, certain to achieve much in the future, alike in the promotion of a good understanding between the two English-speaking countries and in the facilities for research afforded. Sir Arbuthnot Lane, like all the preceding speakers, paid tribute to the great career, so sadly cut short, of Surgeon-General Gorgas, whose life-work formed a perfect example of what internationalism in medicine can achieve.

Sir Thomas Clifford Allbutt is to be sworn a Member of the Privy Council. The honour is the more signal when it is noted how few of the present Privy Councillors have become such on the ground of scientific attainment, while, as far as we know, no doctor has ever before attained to this distinction in recognition of pathological and professional work.

INDEX TO "THE LANCET," VOL. I., 1920.

THE Index and Title-page to Vol. I., 1920, which was completed with the issue of June 26th, are given in this number of THE LANCET, and will not be issued separately.

THE BRITISH MEDICAL ASSOCIATION.

EIGHTY-EIGHTH ANNUAL MEETING AT CAMBRIDGE.

THE 88th Annual Meeting of the British Medical Association was concluded last week, and on all sides those who assisted in the session have had reason to be satisfied with the work achieved, as well as with the facilities provided so generously by the University and city of Cambridge. And Cambridge was arrayed by nature for the occasion, the noble colleges and ancient streets being radiantly beautiful in the perfect summer weather.

The final ceremonies included a dinner party in Gonville and Caius College given by the President of the Association, Sir Clifford Allbutt, who is a Fellow of the College; a reception at Emmanuel College by Dr. Peter Giles, the Master of the College and Vice-Chancellor of the University; a reception by the Mayor of Cambridge at Christ's College; a reception by the Master and Fellows of Trinity College; and the Annual Dinner of the Association, held by permission of the Master in the Hall of St. John's College.

The last item on the scientific programme was the Popular Lecture, and this was delivered by Dr. G. S. Graham-Smith, who took as his subject "Flies," and once again emphasised for public information the primary part played by flies in the dissemination of disease.

SECTION OF MEDICAL EDUCATION.

THURSDAY, JULY 1ST.

This section opened with five papers on

The Place of Preliminary Science in the Medical Curriculum.

The papers were an address on the subject generally by Sir GEORGE NEWMAN, President of the section; addresses with reference to particular sciences by Professor Arthur Smithells (Chemistry), Professor Sydney Hickson (Biology), Professor Arthur Keith (Anatomy), and Professor Sir Ernest Rutherford (Physics), and a paper by Professor Lorrain Smith on the connexion between the teaching of preliminary science and pathology. Professor Lorrain Smith's paper is published elsewhere. The discourses were taken as read, the authors merely outlining the essentials in brief speeches for the purposes of debate.

The PRESIDENT commenced by calling the attention of the section to the distinction of the men who were contributing to its work and hoping that something practical, perhaps in the way of resolutions, would emerge from the debate. Passing to the consideration of the subject of medical education in general, he said that the purpose of a medical education is the equipment of the practitioner in knowledge and skill. The curriculum must incorporate the principles of medicine as interpreted in current knowledge. It must also comprehend its practice in relation to the needs of the time and the art of the practitioner. Sir Clifford Allbutt had explained that the new birth of medicine "is nothing less than its enlargement from an art of observation and empiricism to an applied science founded upon research; from a craft of tradition and sagacity to an applied science of analysis and law; from a descriptive code of surface phenomena to the discovery of deeper affinities; from a set of rules and axioms of quality to measurements of quantity." Nor were the signs of expansion limited to practical medicine; there was the new work on the cell—in physics, in chemistry, and in biology. The cell theory—cell basis, cell division, the nucleus, the nucleolus—is yielding its secrets, and something of the hidden powers of the chromosome of the germ cell and the internal secretion of chemical substances, whether they be hormone, toxin, or antitoxin, is now revealed. It would seem impossible to exaggerate the effect on the science of medicine of the new knowledge of the chemical and electrical changes going on in the cells of

living tissue. Secondly, the character of the curriculum would also depend upon the medical needs of the time. To-day there were two special factors at work—(*a*) the new claims of the State upon the doctor, social, scientific, clinical, and (*b*) the further development of clinical teaching within the curriculum—making their insistent demand on the student.

The establishment of "clinical units" was but an expression of the growth of integration. His teaching work, instead of being casual, secondary, incidental or spasmodic, would now become the chief task of the clinical instructor. Moreover, the unit consisted of a staff of competent men working as a group or team who pooled their experience, and there was full integration of the science and art of medicine and surgery, the teaching of which might thus be raised to university standard. The association of research with intimate and intensive study, which should comprehend Sir James Mackenzie's subjective and associated phenomena, should investigate the mechanism of symptoms, and should follow end-results back to their origins, was the third advantage secured by the clinical unit system.

It was by the gradual evolution of this unit method over many years that the necessity of further development in the curriculum had become obvious. Not revolution but reform was needed, and even reformers must have regard to the facts (*a*) that the scope and character of secondary education was not yet settled, (*b*) that medicine itself was in a transitional state, and (*c*) that the policy of the nation in regard to the ultimate nature of the public medical services had not yet crystallised itself. However, it would appear that the four main reforms needed in the medical curriculum were: 1. A lightening of the curriculum at both ends; in other words, fuller preparation in science before entrance to the medical school, and a postponement of instruction in certain specialties and in general practice to the post-graduate period. This question of lightening without lengthening the curriculum was of cardinal importance, as in the present overloaded condition of the five years there was insufficient time allowed for true study, for digestion and assimilation. Several remedial steps might be suggested. Elementary physics and elementary inorganic chemistry might be taken at the secondary school, though preliminary science for medical students must be undertaken in the medical school; materia medica might be greatly reduced; the didactic lectures might be diminished in number; some overlapping might be eliminated; each term might be extended by a week and the medical course commenced in April; specialism might be unloaded from the final year or at least reduced in bulk; and above all the degree examinations might be shortened and modified by assessing the class examinations as an essential part of them. 2. A fuller study of the sciences preliminary to medicine and a nearer application of these subjects to clinical work. Above all, there was great need of biology (anatomy and physiology). Its principles were the answer to many questionings. It was the fundamental theme. 3. Development of clinical teaching of university standard. 4. There was need of further State aid, though with a minimum of State control. The education of the medical man was no longer a proprietary or merely professional interest. It was of national concern, for the health of the people was the principal asset of the State.

In the course of a few introductory observations on the place of preliminary science in the curriculum Sir George Newman said that in the first place it seemed evident that the development of clinical medicine and surgery in response to the demands of the age made a new and clear call for the improved teaching of the preliminary science subjects. Some advocated their removal from the medical curriculum, but he was convinced that they were more essential than ever. Physics, chemistry, and biology were key-subjects, absolutely fundamental, which formed the basis of a general education in science, and were the only basis of sound generalisation. The great medical subjects consisted of physics, chemistry, and biology applied to the life, form, and function of the human body in health and disease. The patient was a case of anatomy, of physiology, of pathology to be interpreted and treated on grounds and by means which were essentially physical, chemical, and biological.

Sir George Newman gave examples of the application of the principles of mechanics, heat, light, sound, electricity in medical practice, and of the extent to which biochemistry and chemical physiology depended on organic and inorganic chemistry. He pointed out also the need of a closer association between physics and chemistry on the one hand and biology and medicine on the other. He recalled Huxley's warning that teaching in biology cannot be attempted with success until the student has attained a certain knowledge of physics and chemistry; for although the phenomena of life are dependent neither on physical nor chemical but on vital forces, yet they result in all sorts of physical and chemical changes, which can only be judged by their own laws. Happily, the relation between chemistry and medicine was being drawn closer. At Edinburgh there was to be a laboratory for clinical therapeutics in the hospital, the teacher of chemistry was to lay the foundations of physiological chemistry and clinical chemistry, there was an advanced course of medical chemistry for third and fourth year students, and after October, 1921, students beginning the study of medicine would have to pass an entrance examination in elementary chemistry before admission. As to biology its claim was supreme; it was the very essence of medicine, which, indeed, was but one of its forms and expressions. It was not an introduction to medicine, but its foundation. If the medical man were not a biologist he was nothing. But there was a still more important aspect of biology than that which was immediately utilitarian—namely, as the basis of comparative medicine. If there were one thing more than another which was lacking in English medicine it was its comparative study. Human anatomy, embryology, and physiology were parts of comparative anatomy; we built up our knowledge of man by study of the structure and function of animals. Likewise human pathology should be studied as part of a comparative pathology affecting both animal and vegetable worlds.

Sir George Newman indicated two ways in which progress can be made. First, biology itself can be brought into a larger place in the curriculum instead of being, as in some medical schools, relegated to a subordinate position or even neglected—unequipped laboratories, poor salaries, little opportunity, perhaps feeble apprehension. Biology must be taught in the right manner, and in due time the course might be transferred from the first to the third year. Due emphasis should be given to the comparative study of the development of the ectoderm and endoderm, the origins of the blood and nervous systems, the functioning of sense organs, the formation of the body cavity, mesenteries, primitive excretory organs, the alimentary canal, and the processes of digestion and absorption. The comparative study of protozoology, helminthology, and parasitology, and their relation to disease in man is the final issue of the course. Still another point to be borne in mind is the application of biology to society in the science of sociology, where Huxley and Herbert Spencer led the way. Sir George Newman considered the two chief needs of English medicine: (*a*) the fuller integration of its several branches and constituent parts, and (*b*) its new relationship to sociology.

He concluded: It is not only a device here or an adjustment there that is needed, it is the biological outlook and spirit that is required—the capacity "to see great truths than touch and handle little ones"—for biology, pure and applied, is the most educative, germinative, and dynamic subject of the whole curriculum. It opens the windows of the mind, it makes possible a conception of the unity of things, and it gives proportion and measurement through the entire range of medicine.

The Teaching of Chemistry.

Professor ARTHUR SMITHELLS spoke of the teaching of chemistry to medical students. He said that no one could fail to be struck by the greatly increased number and importance of the applications now being made of physics and chemistry to advance the art of healing.

Modern physiology alone had been brought to such a condition that for its full comprehension a really sound and substantial knowledge of chemistry of university standard was quite indispensable. It was universally agreed that some knowledge of the crudest facts of chemistry was quite indispensable for the medical man. Such knowledge could be picked up very quickly by anyone of moderate intelligence; it was not of necessity a serious mental exercise or intellectual outfit, and it would seem to be a matter of little importance when or where it was acquired. The teaching of chemistry conceived in this spirit was not, however, very exhilarating either to teachers or students. The dissatisfaction at present bound up with the teaching of chemistry to medical students was due mainly to the feeling among students and even among doctors that the study of preliminary science was a penalty rather than a privilege, an obstacle to be passed before one could enter upon the highway of true professional study, not a foundation to be built upon, not something to be assimilated and incorporated with succeeding knowledge.

The mere phrase-book knowledge of chemistry was certainly far from satisfying the declared aspirations of those who ultimately control the whole of medical education, and lay stress upon a proper grasp of scientific method and a scientific attitude of mind which will permeate all subsequent studies. Professor Smithells proceeded: "I think it must be admitted that we who have been teaching science in universities have failed very decidedly to achieve this end, and that somehow or another we have gone wrong. The little regard that our work has earned is shown by the deliberate act of the profession in affirming that all that we have done can now be perfectly well done at school. This means, of course, that we have neither specialised our teaching effectively towards medicine nor given it any intellectual weight which makes it the sort of thing that can only be reasonably expected from a university."

When considering schemes for arousing greater interest in chemistry in the medical student Professor Smithells suggested that professional teachers were very apt to go wrong by attributing to the average student the same sort of capacity for interest in abstract studies as they themselves, by their very nature, possessed. Some years ago Professor Smithells had decided to separate the medical students from others taking the elementary course of chemistry with the object of altering the substance and form of the teaching as far as seemed legitimate towards bringing it into closer relation with matters of special concern to the student of medicine. It seemed to him remarkable that in those universities where the teachers were their own masters so far as examining was concerned, and where they were practically free to go their own way, so little had been done to introduce a directional element into the preliminary scientific studies of medical students. Happily, there was now evidence of a considerable change. Without interesting the students it was not easy to teach them, but it was both possible and legitimate to invest even elementary teaching with a topical character. It was noteworthy that the University of Edinburgh had lately established a chair of chemistry in the interest of students of medicine, occupied by Professor G. Barger, who had explained the general lines on which he was proceeding in a letter which Professor Smithells read to the meeting. The letter began as follows:—

"It is proposed that I should ultimately have under my control (directly or indirectly) the whole of the chemical teaching of medical students, including physiological and clinical chemistry, but for the present I am teaching only inorganic and organic chemistry to first-year students and giving occasional more advanced lectures on special subjects. No previous knowledge of the subject is at present required from students entering my class, but in October, 1921, a new regulation comes into force which will demand from students coming to me an elementary knowledge of inorganic chemistry, at least up to the standard of the London Matriculation." Professor Barger then proceeded to give details of the syllabus and time allotted to various branches of the subject, and explained the principles which guided his method. He had convinced himself that before taking his degree the average medical student forgets most of the chemistry he learns in his first year. Hence he laid great stress on general principles, but mentioned little detail. Since he lectured to medical students *only*, he could afford to omit such things as the metallurgy of copper, and could illustrate general principles by examples of medical importance. His main concern was to make a basis for physiology, and hence dealt with the fats, carbohydrates, and something of the proteins pretty thoroughly, but said little about benzene compounds. According to Professor Barger, "the interest of the students is at once aroused when they grasp that they are being taught with a view to their later professional studies, and they always respond to efforts to help them in this direction."

Professor Smithells considered it desirable that medical students should be taught some chemistry at school. It was extremely difficult to do anything effective in a single year with students brought to the university at the age of 17 or 18 with not even a rudimentary knowledge of scientific facts and with their scientific faculty almost atrophied. Many medical students now had been taught chemistry at school, and in recent times the science teaching in schools had improved remarkably; but he looked upon the intensive study of science in school years with great distrust, based upon the painful experience of having had to deal much with students who arrive at the university in that worst possible plight of having a large mass of undigested knowledge and a feeling (which so far as facts are concerned might be largely warranted) that they had heard before all that would be told them. Moreover, a year in a university atmosphere ought to do something towards producing a maturity of thought, a breadth of scientific outlook, and a general intellectual stimulus that could not easily be impressed on school boys in the environment of school. But considerable reform in university teaching of chemistry must be made if the claim for university as opposed to school teaching was to be substantiated. Whatever was done in relation to the quantity of chemical teaching of medical students Professor Smithell was convinced that its quality might be greatly improved. Medical men were not often in possession of a live and available knowledge of even the fundamental principles of chemical science, and many of them regretted their inability to keep in satisfactory touch with the abundant and profoundly important discoveries now being made on the borderland of medicine and the exact sciences.

In conclusion, Professor Smithells said: "I feel that it is incumbent on us who are charged with the teaching to make a drastic reform, and I am confident that this can be done in such a way as to justify fully the retention of chemistry as an integral part of the university medical curriculum."

Physics in Medical Education.

Professor Sir E. RUTHERFORD, in discussing the place of physics in medical education, said that in several of the universities, and notably in Oxford and Cambridge, the abler students were advised to take a degree in pure science before or during their professional studies, and there could be no doubt of the great advantage to the profession of having a regular supply of able men whose training in science had been sufficiently broad and deep to take full advantage of the subsequent teaching. It was not, however, feasible for various reasons to expect the great majority of medical students to follow such a course. In his remarks he proposed to deal mainly with the pressing question of the scientific education of the *average* medical student leading up to the first M.B. The general opinion among those who had to do with the teaching of medical students in our universities for the first M.B. was that the existing state of affairs was highly unsatisfactory and called for drastic changes. He continued: "The best method of dealing with the present unsatisfactory situation seems to me to require a preliminary knowledge of science, and particularly of physics and chemistry, before admission as a medical student. This preliminary training can best be given in our schools, where, instead of being concentrated in a brief course, two years or so may be devoted to gaining a sound knowledge of some branches of physics and chemistry. The element of time is, to my mind, of great importance in gaining a grasp of scientific principles, and for this the present university training is much too concentrated." On admission of the student to the university he would have had a sufficient preliminary training to gain full advantage of the university instruction. This teaching

should preferably be given by a man of high scientific standing with some knowledge of, and interest in, the application of physics to medicine. The course should not be a repetition of the subjects taught at school but devoted mainly to a consideration of the properties of matter (electricity and magnetism), and possibly a consideration of the theory and use of optical instruments employed in the medical profession. Under properties of matter special attention would be directed to subjects like surface tension, diffusion, osmosis, &c., which were of special importance in physiological processes. A sound knowledge of the elements of electricity seemed to him essential, for not only was it of direct practical importance in several branches of the profession, but electrical ideas tended to become of increasing importance in the explanation of underlying phenomena. The aims of this course would be not to require a knowledge of a multitude of facts, but to give the student a clear understanding of the fundamental ideas of the subject and of their application in medicine.

Professor Rutherford said that his remarks applied particularly to physics and chemistry. Biology presupposed a reasonable knowledge of physics and chemistry, and since it was not likely that our schools would be capable for some time to come of providing good instruction in all these subjects, it might be desirable that biology should be taught by the universities as at present. It might ultimately prove desirable to give in addition a short course of medical physics at a later period of the medical curriculum. The third-year student was in a better position to realise the importance of physics in his more professional studies. Such a course would be analogous in some respects to the course of biochemistry which is given to medical students in Cambridge in their third year.

Courses of Study in Science for Medical Students, with Particular Reference to Biology.

Professor SYDNEY J. HICKSON opened the discussion on this subject. He said that the general result of changes in the last 40 years had been to bring the standard of medical education required both for those students who are contented with the ordinary qualification of the Royal Colleges and for the university degree students to a more uniform level. In attempting to map out the courses of study in science that should be given to medical students as a whole it was necessary to assume that potentially any one of them is capable of taking a position in the highest ranks of the profession. Any one of them might become a consulting physician or surgeon, a distinguished investigator of medical science, or a writer of standard works of reference. A course of study wide enough for a man who is to play a leading part in the profession could not be framed without including some subjects which might not be of much direct practical value to the man in a humble country practice unless the General Medical Council directed the provision of two distinct avenues, a higher and a lower, to a medical qualification, the same opportunities to acquire distinction must be offered to all students.

The question of the most suitable science courses for the first-year medical student was so closely connected with the question of his school education that it was necessary to consider what standard of education is, or should be, required before registration. At the present time a very large proportion of the students who enter the medical schools have no knowledge of any of the sciences. Those in charge of the first year science courses, therefore, had to begin with the most elementary general principles. On the other hand, the smaller number of students who have had some instruction at school in chemistry, physics, and perhaps botany, might regard their first three months at the medical school as a waste of time. It was not desirable or practicable to grade first-year medical students, and the difficulty would have to be met in another way. The real difficulty with all science classes in the first year of medical study is caused by a minority—but often a substantial minority—of students with a low standard of school education. These students act undoubtedly as a certain drag upon the machine. The time had come to demand a higher standard of general education before a student is registered. The first step would be to insist that the lowest standard accepted for registration should be that of the matriculation examination of our universities.

It had been suggested that, in order to provide more time for clinical work in the later years, the preliminary science studies should be transferred to the school period of the student's education. It would undoubtedly be an advantage if every student before entering a medical school could present a certificate of attendance on science classes in school or at a college, but Professor Hickson believed it would not be in the interests of the students, nor of the medical profession as a whole, if the standard required were in any degree lowered. There were not many secondary schools in which the standard of the First M.B. Examination in Physics and Chemistry could be reached, and very few in which any provision was made for the teaching of biology, and in consequence such a transference of science subjects to the schools at the present time would inevitably lead to a lowering of the standard. But whether there was to be a preliminary training in science in the schools or not, the first six months at least of a medical student's career in a university should be spent in the science departments.

In dealing with the subjects taken in the first year of study Professor Hickson thought it might be assumed that chemistry and physics were essential. It would be a hopeless task for any teachers to attempt to carry students into any branch of medicine unless they could assume some knowledge of the elementary principles of these sciences. Perhaps in the near future when the science courses in schools were longer and better, the teaching given to registered medical students in physics and chemistry might have a more direct and practical bearing upon medical science.

Professor Hickson then proceeded to discuss in more detail the courses in biology which he had taught to medical students for nearly 40 years. He believed that by the medium of biology even better than by other sciences, the teacher could instigate and stimulate the power of cautious thinking so necessary to the medical student. This might be the most important object of the course in biology, but it was not the only one. Before passing on to courses of study in human anatomy and physiology, some introductory course of training in biological nomenclature and methods appeared absolutely necessary. The student in the biological department learnt for the first time to verify the facts of anatomy by dissection, to use the scalpel, forceps, and scissors, to manipulate the microscope, and became familiar with the meaning of many words and expressions used in the subsequent medical courses.

There was another direction in which the course in biology might be made of great value to the future medical man. It might be urged, and perhaps with some justice, that the kind of training of hand and mind that I have already mentioned could be acquired by the courses in anatomy and physiology. It could, but with much greater difficulty both for the student and the teacher. Moreover, if this training was left to anatomists and physiologists, the courses in these subjects must be either lengthened or greatly simplified. Further, there were some things that might be of immense value for the medical man which could, and should, be taught in the biological course and could not, under ordinary circumstances, be dealt with at any later stage in the medical curriculum. In his address to the International Medical Congress in 1881, the late Professor Huxley said: "Historically the connexion of medical science with the biological sciences and the full extent and intimacy of that connexion are only now beginning to be apparent." Again: "It is a peculiarity of the physical sciences that they are independent in proportion as they are imperfect, and it is only as they advance that the bonds which really unite them all become apparent." Again, Huxley himself would hardly have ventured to predict how rapidly the advance of knowledge would reveal the bonds that unite biology to the medical sciences. Medical protozoology, entomology, parasitology, and the advancing knowledge of

the laws of heredity derived from biological research, all formed a series of most important links with medical science. Professor Hickson declared that there was only one time in the career of the medical student when the nature of these links between medicine and biology could be indicated, and that was in the course of his biological studies during the first year. In order to allow more time for the realisation of these ideals, the first step in reform must be a reduction in the number of "types" of which a detailed knowledge of structure is required. The type system, however, could not be entirely abolished, and a general knowledge of the anatomy of such forms as the frog, the earthworm, and hydra should be given as an introduction to the study of animal structure, as a training in anatomical method, and as a means of cultivating objective study.

For another purpose there should be given some lectures and laboratory work on an Elasmobranch fish and on a Mammal, but detailed knowledge of the whole anatomy of these vertebrates should not be required. Presumably the dogfish was first introduced into the first M.B. biology schedule for the purpose of assisting the student to understand the complex anatomy of the human head and neck, and Professor Hickson believed that it had admirably served this purpose. But while careful instruction should be given on the heart and arterial system, on the brain and cranial nerves, on the visceral arches and their relations, and also on the kidneys, there were many details of the structure of the dogfish which might well be omitted, and the same remarks would apply to the mammal.

In dealing with the three vertebrate animals referred to, some lectures must be devoted to the question of the fertilisation of the ovum and its segmentation, to the formation of the germ-layers, and to some of the elementary facts about the development of the organs. Facilities for adequate laboratory work might vary in different schools, but at least the early stages of the development of the frog and the first three days of the development of the chick from the beginning of incubation could be demonstrated. The study of some selected examples of the protozoa brought the student into contact with the fundamental phenomena of things that are alive, with protoplasm, which Huxley so aptly called "the physical basis of life"; with the essential features of nucleus and cytoplasm; with the function of sex; and with the problem of death.

Professor Hickson declared his strong conviction that some acquaintance with these fundamental problems should be a part of the equipment of every medical man, and he also considered as an essential part of the course some instruction in those lines of advance which bind more closely biological and medical science. He then gave a few examples to illustrate his meaning. In the biology course at Manchester he had for some years past given a short account of the structure and life-history of the house-fly (*Musca domestica*), demonstrating the difference between the house-fly and the stable-fly (*Stomoxys calcitrans*). A few words of explanation of the different ways in which these two insects might carry infection were quite sufficient to convince the medical student that he was learning something with a direct bearing on his professional work. In dealing with the protozoa some reference should be made to the systematic position and life-history of the malaria organism, of the trypanosomata, and of the entamœbæ of the human intestine. A full account of these organisms should be left to the later studies in the departments of pathology or public health, but some reference to them in the first year should be made in order to clear the mind as to the relation between the two sciences. There were many other subjects of the same kind, such as the story of ankylostoma, bilharzia, and of the human cestodes, an outline of modern researches on heredity, and the zoological position and special characters of man. These subjects need not be included in a rigid schedule, on the principle of "no more and no less," but teachers should be encouraged to indicate to the students more definitely than they had done in the past the bonds that bind together the sciences of the first year with those of the later years of their medical career. The course should be widened in its basis to make it less an effort of memory of details and more an introduction to a wide field of scientific thought. The facts in themselves did not matter much; they were the scaffolding which enabled the structure of a medical education to be built up; and if they had performed their function of giving strength and purpose to the design as a whole they could be discarded.

Speaking of botany in medical education, Professor Hickson said that many of the remarks he had made about the zoological part of biology applied with equal force to the botanical part. He considered that "the study of the organisms that lie on the vegetable side of the imaginary line that divides the animal from the vegetable kingdom, the yeasts, the bacteria, the fungi, and the lower algæ, is so intimately connected with the more advanced studies in cellular and chemical pathology that it forms an almost essential part of the medical curriculum." As an introduction to the experimental methods of physiology botany provided perhaps the most useful assistance to medical education.

The Teaching of Anatomy.

Professor ARTHUR KEITH in opening the discussion on Anatomy said that the problem to be faced was not how to improve the education of the medical student, but how to educate and reform his teachers. The suggestion to get rid of specialisation and to pick professors from the best equipped general practitioners could not be followed without arresting the progress of medicine. Without specialisation there could be no progress. "No man is fit to profess or teach any branch of knowledge unless he has a first-hand experience of his special branch, and is not only capable of adding to its stock of knowledge, but of showing his pupils how improvements can be wrought." The real problem was how a staff of specialist teachers was to produce an army of effective medical practitioners. Was it too much to expect every medical teacher to keep his professional knowledge in such a state that, if called upon, he could resume or assume the rôle of general practitioner? Professor Keith did not think so. With a reformation in the medical teacher of this kind the distinguished specialist whose vision is limited to his own specialty—be it physiology or surgery—would become more rare. Another narrow, and he thought mistaken, outlook on the part of many distinguished teachers led to the attempt to raise a school of research students. If the teacher applied himself to meet the needs of the ninety-nine who are to practise medicine generally or some special department, he would not fail to waken the latent qualities of the one promising research student who might be found in the average class of 100. For the qualities which make a student an instrument of research could not be bred in him if they had not been born in him. Here again the need of reform lay with the teacher.

One other matter needing reform was the scope of our text-books. There was a time when a student's text-book could be a complete repository of all the known facts relating to any particular subject. It was an encyclopædia to which teachers and taught referred if they desired to ascertain the extent of knowledge on any particular subject. "Our standard text-books still strive to serve as works of reference for the research as well as for the pass student. The time has come when a clear distinction must be drawn between the student's text-book and the work of reference. As time goes on the difference between them must become greater and greater. The greatest sinners in this respect are the anatomists and physiologists; their text-books could be reduced by half, with an improvement in the education of the man who is to practise general medicine." Though the general practitioner probably put into practice not a single idea or fact gained in his preliminary studies, these subjects could by no means be excluded as unfit and improper for medical students. "For the man who is to become a master workman in medicine or for one who is to advance medicine in any way they are all of them necessary and invaluable, but they are not essential for the training of a highly qualified medical practitioner. They are for him matters of general education. The proper place of

all these subjects is in the science, not in the medical faculty of a university." Speaking specially of anatomy, Professor Keith commented on its application in general practice and spoke of the desirability of reform in text-books and teaching. He concluded: "Anatomy could be made a living practical part of medicine if only the teacher would ask himself: Could this fact help me in diagnosis and treatment? If not, let that fact repose in the comfortable storage of his works of reference until it has proved its right to enter the currency of applied or applicable knowledge."

Professor J. LORRAIN SMITH then gave the address on the Relation of the Preliminary Science Teaching to Pathology in the Medical Curriculum, which appears in full at the front of this issue of THE LANCET.

The Discussion.

Dr. SIMON FLEXNER, director of the laboratories in the Rockefeller Institute, said that he did not intend to discuss the English medical curriculum, and humorously alluded to the constant confusion of his own personality with that of his brother, Dr. Abraham Flexner, who had studied European medical education. He said that it was axiomatic that education, and education alone, could put a fine edge upon generally infused talent; without appropriate educational methods the information imparted did not fructify, whereas a good system not only brought all the average to a higher level, but afforded opportunity for the best men to do the best work. This, he pointed out, was another way of saying that organisation in education is of the highest importance for all research work.

Professor PIERO GIACOSA, professor of pharmacology in Turin University, and recently engaged in the reorganisation of the Italian medical curriculum, in an address wherein the imperfect knowledge of English, for which he apologised, rendered his remarks the more forcible, inveighed against imitation specialism, and insisted that before a man made any attempt to specialise in a subject he should have a solid base of general knowledge from which to work, and then an organised period of intensive training. "Let the Germans," he said, "investigate Homer in the light of grammar, what modern research meant was an all-round understanding of the great central themes and the interacting problems involved. "Professor Giacosa made an urgent plea to the section that they should work for the establishment of an International Committee which would facilitate a proper interchange of educational facilities between the nations.

Dr. J. C. MCWALTER having expressed his deep dissatisfaction with the existing methods of medical education and having illustrated it by a curious reading of vital statistics, Dr. R. C. BUIST corrected that reading and insisted on the necessity of an accurate preliminary scientific training for the medical student, saying that over and over again he had found it necessary to revitalise the scientific training of his students. Professor RAPER, Professor of Physiology and Biochemistry in the University of Leeds, with special reference to chemistry said that he himself happened to have done a considerable amount of that subject before entering the medical profession, but that he had found the repetition of that work during his student career most useful. His chemistry, when brought into association with clinical work, became a totally different thing from his earlier knowledge. He was able to replace cram by a more philosophical attitude.

Professor JAMES RITCHIE, Superintendent of the Conjoint Laboratory at Edinburgh, asked that the psychological aspect of training should receive attention in medical education, which should mould the student's character and mind, as well as his mental capacity. This would tell greatly in the transition from school to university training. Of the preliminary subjects, he considered physics to be the most important, and he repeated a point, previously made by Dr. Buist, that the great advance occurred when the student was able to consider quantity more than quality, and to perceive the value of accurate measurement. He urged also that the various scientific and professional subjects should not be taught in watertight compartments, but that there should be correlated teaching, and that the interplay of the sciences, particularly in their medical connexion, should be made clear.

Dr. H. G. TANSLEY, in urging that the teachers of scientific subjects should concentrate in the essentials, found that instruction in biology was not treated sufficiently in this way.

Dr. F. O. BOWER, Professor of Botany in the University of Glasgow, pointed out that botany, properly taught, made an admirable introduction to medical studies, familiarising students with the common processes of life; he defended the system of set lectures by saying that the value of the work in all these discourses depended entirely on whether the lecturer was competent to deliver them. He saw no reason why training during general school life in physics and chemistry should not be quite good, but thought that the general schools of the country were not ready to instruct students in biology.

Dr. BRACKENBURY asked the meeting, when they were talking of the standards to be reached by students or to be displayed by professors, to remember that it was necessary for the practice of medicine that the general practitioner should also reach a high standard; he thought that this was just as necessary in his case as in the case of any specialist. He alluded to the unpractical nature of many examinations and many educational courses, and considered that the great need of medical students, in a revision of the curriculum, was a sound general education with which to approach physics and chemistry and biology up to a certain standard.

Dr. J. A. LINDSAY, Professor of Medicine in the University of Belfast, after endorsing Professor Ritchie's remarks on the mischief of teaching the preliminary sciences in watertight compartments, deplored the existing low standard of general education among medical students.

Dr. WARDROP GRIFFITH, Professor of Medicine in the University of Leeds, spoke on the necessity of a continuity in scientific studies. The medical curriculum must be lightened for the student, but, he pointed out, the education in preliminary scientific subjects ought to be kept alive and relied upon throughout the medical curriculum, so that if the student in the course of his clinical work came across "a bit of chemistry" he would understand it and apply the teaching properly.

Dr. CAREY COOMBS agreed with Professor Ritchie on the importance of some psychological training for the medical student.

Sir GEORGE NEWMAN read out to the meeting the following three resolutions which had been handed in:—

1. That the lowest age of registration for the medical student should be 17 years.
2. That in the forthcoming revision of curriculum promised by the General Medical Council the lightening of professional studies would be facilitated if chemistry and physics were made school subjects, biology remaining a professional subject.
3. That with a view to securing adequate training in physics, chemistry, and biology as applied to medicine by courses of these subjects within the professional curriculum, it is desirable to exact a knowledge of physics and chemistry of matriculation standard of all medical students before they are registered.

Professor A. E. BOYCOTT objected to the view implied in the second resolution, as he understood it, that the student's education in chemistry and physics should cease with his school career.

Sir GEORGE NEWMAN said that as the time allotted to the Section was now more than exhausted he would, with the approval of the meeting, submit the discussion and resolutions to the University Grants Committee, and to the Education Committee of the General Medical Council, where they would receive valuable attention.

NAVAL AND MILITARY SECTION.

WEDNESDAY, JUNE 30th.

This Section's proceedings began by an address from Colonel JOSEPH GRIFFITHS, C.M.G., F.R.C.S., the President, introducing a discussion upon

The Army Medical Service in Relation to the Education and Training of Newly-Qualified Men.

Colonel Griffiths, in a carefully reasoned paper, set out the arguments for the employment of officers of the

A.M.S., with whom he suggested those of the I.M.S. might coöperate in training the best newly-qualified doctors of the country for professional as well as administrative duties. Of the men undergoing such training, he said, those required by the Service, especially as administrators, could be kept, while arrangements could be made for placing the others in spheres of usefulness. He pointed to the double advantage of such a scheme, inasmuch as it would assist the young doctor exactly when supervision and guidance are removed, and would form an outlet for the accumulated experience of the army doctor, whose life fits him for a great variety of offices. The pensioned officer, he pointed out, did not cease to work because he was incapable, but is cast adrift by the system. Administrative or scientific posts ought to be available for such officers, while their experience would fit them admirably for training others.

Lieutenant-Colonel R. H. ELLIOT, I.M.S., said that he would not like to see State posts reserved in any way for retired officers. The positions of officers were now greatly improved, and such posts should go to the best men. He expressed the greatest sympathy for the way in which general practitioners did their work, and would like to see more of the administrative posts come their way. The good doctor is, he said, usually a good administrator.

Dr. C. A. BUTTAR, speaking after long and intimate experience of the work done at the Central Medical War Committee, urged that a liaison was necessary between the Services and the civilian practitioners, but, while so far agreeing with Colonel Griffiths, he desired to see the liaison take place not between departments or by any interchange of State posts. Colonel Griffiths would find that the best way of utilising the services of retired officers would be by approaching their civilian brethren, when he had no doubt some system of mutual coöperation could be evolved.

Colonel MCMUNN pointed out that retired officers did not cease to function; the army still had a call upon them, and the needs of the army must come first.

Lieutenant-Colonel HARVEY called attention to the Directorates now in existence in the Army Medical Service whereby Directors of Hygiene and Pathology are appointed by the War Office of high rank, and men of special interests receive special training. In this way by his seventh year of service a man might be marked out for a particular line of work and could continue in that line while attaining to the position of colonel and even general. It was no longer necessary for a man to pass into pure administration to obtain high rank.

Gas Poisoning.

An extremely interesting paper was then read upon the German gas attacks by Colonel P. S. LELEAN, who humorously admitted that he had lectured on the subject before, and had found the occasion announced as "Poisonous Gas by Major Lelean." He described in vivid language the effects of the first treacherous attack with chlorine and the vigorous methods immediately devised by the R.A.M.C. at the Royal Military College, under Sir William Horrocks, to counteract the onslaughts. There was, he said, terrible slaughter of our front line during the first attack, especially in the centre, while the situation was partly saved by the action of a young officer on the left, who, with some idea of dissipating the fumes, ordered all his men to shoot, when the din of the ensuing firing persuaded the Germans that their foul device had failed, so that they did not advance to profit by what they had done. By the time the second attacks arrived masks had been made at headlong speed by an admirable combination of science, manual labour, and commercial efficiency. Of these 5000 arrived in 60 hours, 300,000 in a week, and 2,000,000 in a month. *The second attack led to 265 hospital admissions and 13 deaths.* Almost immediately after the treacherous surprise the defence got ahead of the attack. The Germans then started the employment of lethal gasses, and so numerous were the terrible poisons which, on high authority, it was said were going to be employed, that defensive preparations had to be prepared for no less than 43 of these gasses. More, the gasses themselves had to be made as the result of intensive research before methods of protection could be devised. Colonel Lelean described the devoted work of the officers engaged in this work, who themselves submitted to terrible and prolonged tests in the lethal chamber to ascertain if the protective measures were efficacious, and efficacious over a sufficient period.

The last stage in gas warfare was the use of lachrymatories, and the reply to these was explained by Colonel Lelean, who also demonstrated the box respirators.

The paper was warmly applauded.

VENEREAL DISEASES.

THURSDAY, JULY 1ST.

This section was under the chairmanship of Mr. E. B. TURNER. Although the section is a new one it was very well attended. The largeness of the audience and the interest shown in the discussion so fully justified the formation of this new section that the chairman at the close of the meeting declared his intention of urging that on future occasions two days should be devoted to the discussion of venereal problems. Opening papers were read by Dr. MORNA RAWLINS and Dr. LEONARD FINDLAY.

Dr. MORNA RAWLINS dealt with the subject of venereal disease in women. After calling attention to the importance of the venereal problem, Dr. Rawlins discussed the question of treatment in syphilis. Three points of especial interest were brought forward: (1) the treatment of cases intolerant of arsenic and mercury; (2) the treatment of ante-natal syphilis; (3) the need of collaboration between the syphilologist and the medical officers of the special departments of hospitals. "Few medical officers working in venereal clinics can find the necessary time, even if they have the necessary skill, for careful examination of the special systems." For this reason such a medical officer should be able in case of doubt to utilise the special knowledge of his colleagues to prevent wrong diagnosis and to serve the best interest of the patient. For the treatment of those rare cases that showed a marked intolerance to arsenic or mercury Dr. Rawlins relied mainly on sulphur. This could be administered as collosol sulphur, sublimed sulphur, or intramine. The action of the last-named was particularly satisfactory and rapid, and could be taken advantage of in the treatment of mercurialism. In introducing the subject of ante-natal syphilis, Dr. Rawlins urged that more stress should be laid on clinical signs and history, and less on the Wassermann reaction. Treatment could be continued with safety right up to end of pregnancy. Even when begun as late as the seventh month the results of treatment had been very satisfactory. The treatment of gonorrhœa in women was, in the opinion of the reader of the paper, still in the experimental stage. Various preparations could be used in the treatment of the ordinary subacute case of gonorrhœa, the most useful being protargol (10 per cent.), eucalyptus oil in olive oil (40 per cent.), picric acid in glycerine (50 per cent.). Douches were of little use, but pessaries (protargol 10 per cent. or sauerin) were often beneficial. Before starting vaccine therapy a careful examination must be made for pelvic complications. If infection of the tubes and ovaries had taken place a much smaller initial dose of vaccine was advisable. Finally, before discharging a patient a very high standard of cure should have been attained. The more conscientiously this standard of cure was insisted on the less became the risk of relapse and of spreading the disease. Dr. Rawlins's paper was then discussed.

Sir JAMES GALLOWAY uttered a warning against the abuse of antisyphilitic remedies. He quoted cases that had been subjected to a severe course of treatment in the absence of any clear diagnosis of syphilis.

Dr. AMAND ROUTH advocated very energetic measures in the treatment of gonorrhœa in the female. In discussing the question of ante-natal syphilis he stated that he had come across several cases in which a positive Wassermann had become negative as a result merely of pregnancy. He believed that the placental ferments afforded some degree of immunity.

Dr. F. MACKENZIE urged that syphilitic women should be instructed how to avoid pregnancy in order that the

appalling harvest of defective and syphilitic children might be curtailed.

Mr. KENNETH WALKER claimed that the urgent necessity lay in providing these women with adequate treatment during pregnancy rather than in the prevention of pregnancy. The ante-natal treatment of syphilis was attended with astonishingly good results. A subject that demanded far more careful consideration, on account of the difficulty of treating it, was the subject of gonorrhœa in the female. Amongst other measures possible was the application of diathermy to the cervix. Although he had seen some very bad results from the use of electrical methods in the male, diathermy and electrolysis had given some satisfactory results in the female.

Colonel C. E. HARRISON agreed that the treatment of gonorrhœa in the female was still very unsatisfactory. The problem was one of drainage, and he was in favour of the use of glycerine-containing preparations rather than of strong caustics. Dr. Ainley Walker's work had suggested that the antigenic power of the blood might possibly be increased in the case of gonorrhœa by the use of such drugs as salvarsan in combination with vaccines.

The Treatment of Syphilis in Infancy and Childhood.

Dr. LEONARD FINDLAY, in introducing his paper on this subject, dwelt on the enormous loss of child-life that was directly attributable to this one disease. As an example of this could be quoted the striking figures obtained by Dr. Kerr Love, who collected the complete records of 21 families. Of the 172 pregnancies occurring in these families 75 ended in stillbirth, and of the 97 children born alive 31 were deaf or blind. Although the introduction of dioxydiaminoarsenobenzol had enormously improved the results of treatment, syphilis in childhood still remained a very serious problem. When treated with mercury alone a mortality of 71 per cent. had occurred in a series of cases under 3 months of age. With combined treatment by means of mercury and arsenic this mortality had been lowered to 20 per cent. In administering mercury amongst infants the reader of the paper relied on inunctions. Of the two methods of injecting salvarsan, intramuscular and intravenous, he preferred the latter. Intramuscular injections were practically always associated with pain and discomfort. For intravenous injections the veins of the scalp were employed. With the technique he employed the injection became a comparatively simple affair. In children over 2 years of age the veins of the scalp were, as a rule, not visible, and either the external jugular or the veins of the elbow flexure must be employed. An anæsthetic was often necessary in such cases. The initial dose for infants was 0·05 of neo-kharsivan, increasing to 0·15 or 0·20. In obtaining a negative Wassermann observations seemed to indicate that the duration of treatment rather than the total quantity of drug given was the deciding factor. The percentage of cases in which a negative Wasssermann was obtained rose steadily with the number of injections given. Amongst older children this negative Wassermann was obtained with greater difficulty. In several children of 8 and 9 years of age as many as 20 injections had failed to convert a positive into a negative Wassermann. Once a negative reaction had been obtained it very seldom became positive again. Prophylactic treatment was the only rational method of treating congenital syphilis. When this had been carried out by means of mercury and potassium iodide alone relapses had been frequent, but the use of salvarsan generally resulted in permanent benefit. All the children born subsequent to treatment were free from disease. In discussing the question from the point of view of national health, the reader of the paper urged that all miscarriages and stillbirths should be notified. If subsequent investigation and blood reaction indicated that syphilis was the cause of the miscarriage prompt treatment should be undertaken. No antivenereal campaign could afford to neglect notification. Ophthalmia neonatorum was already notifiable, yet this disease was responsible for only 20 per cent. of the blindness of childhood, as compared with 30 per cent. due to syphilis. Serious objections had been raised to notification in the case of tuberculosis, and yet these objections had been overcome. The ideal treatment of congenital syphilis meant treatment of the syphilitic mother, and in order that this should be effectually carried out compulsory notification was a sine qua non.

Dr. DOROTHY BUTCHER confessed to harbouring conservative views with regard to the treatment of syphilis. She placed great reliance on hyd. cum creta, but insisted that the preparation must be fresh and free from signs of oxidation.

Dr. AGNES DUNNETT asked whether in cases of repeated stillbirth with a consistently negative Wassermann it was advisable to insist on treatment.

Professor PECHÈRE (Brussels) complimented Dr. Rawlins and Dr. Findlay on the excellence of their papers. He was an enthusiast in the use of arsenical preparations for congenital syphilis. He agreed with Dr. Rawlins on the benefit to be obtained from sulphur, and had obtained very satisfactory results from the use of a new preparation, sulpho-arseno-benzol. Personally he had employed the intramuscular route, but after having listened to Dr. Findlay he would test the intravenous method. He found that sulpho-arseno-benzol gave rise to very little pain when injected intramuscularly.

Dr. MASTERMAN laid stress on the importance of treating congenital syphilis at an early age. The older the child the more intractable the disease tended to become.

Dr. HUDSON considered that notification of stillbirths was an excellent idea. It would materially assist in the antivenereal campaign.

Dr. MACKENZIE warned against placing too much reliance on the Wassermann reaction. The public and a portion of the profession accepted a negative Wassermann as a certificate of cure.

Mr. TURNER, in rising to close the discussion, emphasised three points. The first was the advisability of cultivating the clinical instinct, and of not relying entirely on accessory methods of diagnosis, such as the Wassermann reaction. The second point was the urgent need of early diagnosis and early treatment in dealing with venereal disease. The third the necessity of preserving professioual secrecy. When the public was ready to accept compulsory notification such a measure would come. Such a moment had not yet arrived.

After Dr. FINDLAY had replied to the various questions that had been raised the meeting was adjourned.

During the course of the afternoon demonstrations were given in methods employed in the treatment of venereal disease. Dr. J. E. BARNARD demonstrated the use of dark ground illumination in the detection of the *Spirochæta pallida*. He also showed a method of testing condensers by means of an instrument he had invented for the purpose. Colonel HARRISON discussed the treatment of gonorrhœa in the male, and Dr. RAWLINS gave a demonstration of instruments employed in the treatment of gonorrhœa amongst women. The demonstrations were very well attended.

SECTION OF MEDICAL SOCIOLOGY.

FRIDAY, JULY 1ST.

The Future of Medical Practice.

An illuminating discussion on the Future of Medical Practice took place on July 1st, in the section of Medical Sociology. The views of all sections of medical practitioners were clearly represented; in addition, Dr. T. R. BROWN, of the staff of the Johns Hopkins Hospital, Baltimore, gave the meeting information as to hospital arrangements in the United States, and Mr. Alderman JENKINS enunciated the views of the Labour Party with regard to a whole-time medical service. In opening the discussion,

Sir GEORGE NEWMAN said his task was to organise on behalf of the community a profession whose whole tendency is individualistic; we must not lose that precious quality individualism, hence the "nationalisation" of the medical profession is an impossibility. But profound changes have occurred recently; within

a handful of years the State, in a fit of absence of mind, has in 20 or 30 Acts of Parliament placed statutory duties on individual practitioners; a new relationship must be created between the State and the doctor. The profession is fearful of the imposition of some cast-iron system which might in practice make the medical practitioner servile, dependent, and fettered. To promote a clear and well-established understanding the doctor must acquire a knowledge of the evolution of local government, and the main purposes of the bodies dealing with health, pensions, Poor-law, education, and insurance; the layman, besides specialised knowledge of the work with which he is primarily concerned, should learn as much as he can of professional tradition and sentiment, of the scope and opportunity of voluntary work which touches the profession, and of professional organisations and of their history and relation to each other.

Five outstanding problems now faced the medical profession in its relation to the State.

First, we must find a new unit of health government. In defining the areas of the Poor-law unions, the local sanitary authorities, the local education authorities, the Insurance Committees, and the local War Pensions Committees the country has been mapped out five times over, but the charting has been done by different hands at different times and for different purposes, causing duplication, overlapping, and confusion. Clearly, there would be advantage in having one authority for all health purposes. Another common-sense requirement is uniformity of administration in all comparable areas; all through the country there is need for the adoption of accepted standards and a larger measure of equalisation and uniformity of central and local action. The plan evolved must represent not what the State alone or medicine alone would prefer but the will of the people at present. We require an extension and coördination of medical provision. At present there is inadequacy, unequal provision, and piecemeal effort; we must bring together in proper relation the provision of medical treatment in the home, at the clinic, in the hospital, and in the convalescent home not for the pauper class only, but for the whole of society. A properly connected medical policy will not arrive in our lifetime; all that we can hope to do is to lay some of the foundation stones. The future of the hospital system constitutes another problem with many issues. We have at present no connected hospital system; the relation of hospitals to each other and to the contributory clinics and the insurance system is a typical issue which calls for settlement. A fourth subject, and perhaps the most important of all, is an adequate method of education of the undergraduate and the practitioner. A different kind of doctor is needed in these new times; he requires in addition to the learning and skill of former days an improved training in new subjects, in preventive medicine, and in the political science of communal responsibility. Some specialisation of practice there must be, but we must recognise that such diseases as tuberculosis and venereal and heart disease will never come under control until and unless the general practitioner is in a position to deal with them. Lastly, the medical man of this new age is concerned with the advancement of humanism. The doctor must be the chief educator of the people in the way of health; in being that he cannot escape his share of responsibility in the study and handling of many of the medico-sociological problems which surround us—education, recreation, housing, the conditions of industry, sobriety, cleanness of living, the prevalence of venereal disease, prostitution, the penal laws, the causes of certain crimes, the integrity of family life—all such matters concern us, and to fulfil our vows we must be concerned with them. We cannot be wise healers of the patient or the community without a large sympathy and a liberal humanism. But we must not think that the medical factor is the only or the decisive factor; we must interrelate medicine with the social, moral, and ethical movements and aspects of man's mind.

Sir WILMOT HERRINGHAM dealt with the problem from the point of view of the consultant. Although it is sometimes said that the advance of the general practitioner is so great that the consultant is no longer necessary, he thought that consultants would not only persist but increase; not only will the growing points of special technical skill and scientific knowledge necessitate fresh classes of consultants, but also there will always be the sage reflection that two heads are better than one, and the desire to satisfy the anxieties of the patient and his friends.

With the advance of medical science the consultant has to consult more persons himself; at present these consultations are carried out with the maximum of expense to the patient and waste of time of everybody concerned. The poorer patients had the best treatment in the world—that provided by the hospital. Five or six specialists meet in the ward and consider his case; this system works quickly, without friction or much trouble, and the minimum expenditure of time. Contrast this with the nursing home, rarely built for its specific purpose; the other men whose opinion is wanted have either to make a special journey there or the patient has to make an uncomfortable if not painful journey to them. The great need is for some form of institution within the means of the ordinary middle-class patient; the nursing home's charges equal those of a first-class Atlantic liner. The only sound remedy is to extend to private patients the benefit and convenience of treatment at a hospital. Proprietary hospitals run by a doctor with other doctors as employees will not catch on in England. In London there has long been, in Fitzroy Square, a paying hospital financed by laymen which the patients use as they would use a nursing home and where they are attended by the doctor of their own choice and make their own arrangements about fees. At St. Thomas's the paying wards are much on the same system. At King's and Guy's only the staff of the hospital attend the paying patients. The ideal is that the hospital should be the centre of a doctor's life; his home should be in the country and he should journey daily to the hospital and see his patients there, both those who come to consult him as well as the in-patients.

Dr. ALFRED LINNELL spoke from the point of view of a doctor practising in an isolated district. He considered the feeling of the bulk of the general practitioners was so strong against a whole-time medical service that there was no danger of their becoming State servants. The problem of the future of general practice consisted in the proper dove-tailing of a State-controlled service into the general scheme of practice.

In the sphere of preventive medicine the employment of whole-time officers with special training is inevitable, but closer coöperation between these officers and the general practitioners is highly desirable; the latter should be given every opportunity to learn preventive work and be employed at a remunerative wage in any preventive work he is able to undertake. In prenatal work the general practitioner should play an all-important part. For school medical work the whole-time man is more satisfactory from the point of view of administration, but it is hoped that the employment of general practitioners will increase, and no doubt with more experience such a system could be made to work quite smoothly. After the age of 16 the State, through the Insurance Acts, invades the domain of curative medicine in a very decided manner. Although there is room for improvement in certain directions, it would be wise to give the reconstructed panel system a thorough trial. Criticisms of the system are somewhat ungenerous; they fail to recognise that five of the seven years of its working have been war years. All parties seem to unite in condemning the present State system of the medical care of the poor, but it is difficult for Poor-law medical officers of long standing to understand the reasons for this opprobrium. Probably in the future some panel system with free choice of doctor will be adopted in which the local authorities will stand in the relationship of employer.

The relation of the general practitioner to midwifery is rapidly changing; the provision of well-trained subsidised midwives has caused a considerable transfer of normal midwifery from doctors to midwives, but the ideal in a domiciliary service is the association of doctor and midwife in every case, so as to enable the younger doctors to acquire the experience which is necessary if he is to cope with the abnormalities to which he is summoned by the midwife. The provision of maternity homes is an urgent necessity; they make an enormous difference in the comfort of the patient and the doctor. Powerful forces are on our side in getting these homes; the difficulty of obtaining domestic help during the confinement is so great that some provision of this nature must shortly be forthcoming. The rather complicated technique of modern methods of treatment of venereal disease has warranted the establishment of clinics with specially equipped officers in charge, but with increasing equipment of the general practitioner in this respect the necessity for the employment of special officers will probably cease.

As regards tuberculosis the appointment of special officers was probably wise and necessary; they have important consultative and administrative duties to perform. It is on the matter of treatment that difficulty arises; sometimes a doctor is at a loss to know whether he is responsible for treatment or not. He is possibly responsible for certification but not for treatment. He is not kept fully informed of the patient's progress while in the sanatorium. All this could be easily avoided. The "dispensaries" should be

"clinics" for consultative purposes, and at every stage the doctor in attendance should be kept fully informed and made in every way responsible.

The increasing complexity of diagnosis and treatment renders it imperative that greater facilities and better equipment shall be available for the doctor in his battle with disease, while the increasing expense renders some form of organisation an urgent necessity. The associated local health centres proposed should become the general practitioner's spiritual home. Study leave during the early years of practice is urgently necessary; the State should give the financial aid required. The system of assistantship should be further extended and men given an insight into the art of general practice; this would be preferable to systematic teaching in the schools by medical practitioners. State interference in curative medicine means necessarily not only the provision of medical attendance for certain sections of the people with the requisite supervision and control, but also the supply of that organisation of special services, institutional treatment, and post-graduate training for doctors which is at present lacking and can only be provided by the State.

Professor GOWLAND HOPKINS'S address was a plea for personal contact of the laboratory worker and the clinician. Communications between them now are practically limited to the post; the clinician asks a definite question and merely expects the answer, "Yes" or "No." But if they were to meet and think together the possibilities of the laboratory as an aid to diagnosis would develop.

It is remarkable, he said, how largely the use of chemical methods in diagnosis has been confined to mere tests for albumin or sugar in urine. Much earlier information and more discriminating knowledge concerning renal failure can even now be obtained by simultaneous analyses of blood and urine, and on the same lines a better realisation of the significance of this or that case of glycosuria. So also estimations of alveolar carbon-dioxide tension made simultaneously with determinations of the hydrogen-ion concentration or the alkali reserve of the blood are giving fresh precision to knowledge in other diseases without inconvenience to the patient.

How are we to catch the patient to apply these micro-methods of blood analysis? Twenty years ago precautionary visits to the dentist were confined to ladies; it will perhaps be less unthinkable 20 years hence than it would seem to be now for the middle-aged to pay precautionary visits to the doctor on behalf of their kidneys. It is often held that this laboratory work should be concentrated in a few large centres. Dr. Hopkins wished to combat this view strongly; if adopted it would cut off the laboratory worker from the stimulus of real contact with the clinician and clinical material.

Later in the discussion Sir KENNETH GOADBY, who acted as liaison officer during the war between the clinician and the laboratory worker, said that the surgeon and physician were prone to scorn the laboratory in the earlier stages of disease and seek help too late. When both got together we should get team work of the utmost value. If laboratories were established all over the country where the general practitioner could do some work in his spare time, he could guide the laboratory worker, who has a tendency to go off on side issues. In dealing with industrial disease especially does the general practitioner want the help of the laboratory; there are several methods of early diagnosis of lead poisoning available before symptoms are present. If the doctor takes the specimen to the laboratory himself he will ask supplementary questions of the greatest value. To enable us to help the industrial worker the Labour Party must assist in the discipline of its members; when we attempt to collect facts the workmen must help by giving full information.

Mr. E. W. MORRIS, House Governor and Secretary of the London Hospital, said that the present position of the hospitals was the result of self-sacrifice on their part. In the stethoscope days the cost of a bed was £60 a year; owing to the increasing complexity of diagnosis department after department had been opened and the cost in 1914 had gone up to £150 a year. But this was a healthy increase; the present cost, £200 a year, represented an unhealthy increase.

The hospitals were proud of having been able to manage with voluntary support only hitherto, but they were prouder still of being able to do good work and, if necessary, would have to break away from voluntary work alone. £100,000 a year could be collected for a hospital by voluntary subscriptions; £200,000 could not. Money must be got either from the patients or from the State. The locality of the London Hospital made any proposal to close a part of the hospital and reopen it for paying patients impossible, but each patient should pay what he can afford; he should certainly pay his "hotel" expenses if possible. As regards money from the Government, the London Hospital would put their pride in their pocket and take what they could get, but there is the principle of humanism to be considered. The hard mechanism of the Poor-law infirmary might creep into the hospital; we must not do away with the blessing of giving. But this is a different thing from receiving State help for services rendered. Seventy-five per cent. of the patients in the London Hospital are panel patients. Some of the panel doctors in the vicinity have a panel of 10,000. The hospital gets nothing for this work from the doctor or the patient.

The feeling is changing as regards the payment of the honorary staff. Mr. Morris holds the view that the staff should give their whole time to the hospital. He would divide the beds into groups, and for a period of, say, five years, appoint a whole-time medical officer at £2000 a year, with assistants appointed for one year, the first at £1000 a year, the second at £800, the third at £365. For each unit two resident house men are required and a special secretary to undertake the card-index work; proper laboratory help is also necessary. Such a medical and surgical unit are in existence at the London Hospital. Each has about 70 beds and sees out-patients on two afternoons a week. He would like to see posts found in these units for doctors in general practice; the unit would gain by the information the general practitioner could bring concerning early stages of disease.

Many reforms are wanted in hospital management. Above all, a future must be made for the nurses; at present there are only 12 positions in the country with a salary of £400 a year or more. Half the hospital beds are in the wrong place. The average stay in hospital of a patient is three weeks, two of which could well be spent in a less expensive institution. The war has taught us another lesson; we want a coördinating centre so that if a patient cannot be taken into one hospital the friends can learn where he can be admitted. Much of the work done at present is wasteful; chemists are examining samples of drugs, &c., for each hospital separately, whereas this work could easily be done by a common staff.

Alderman C. S. JENKINS expressed the views of the Labour Party. Before the passing of the Insurance Act it was difficult for a workman to get adequate medical attendance; nowadays, when the average wage on which he had to support a family was less than £4 a week, he had very little money to spend on the doctor. The Insurance Act does nothing for women and children. The facts as regards industrial hygiene are appalling; in the boot and shoe industry the average age at death is under forty; 90 per cent. of the deaths are due to respiratory diseases. In the iron and steel trades the average age at death used to be 39, but just before the war the figure had improved to 49. Why should men die at this age? The reason was that flesh and blood are cheap. He agreed that during the war the doctors were overworked, but panel practice was not what it should be. The Labour Party wants the profession to educate workers in the preservation of their health and to study the conditions under which the workers live and work. During the war, when the value of labour was recognised for the first time, the Government set to work to prevent diseases and did good work. Why cannot this work continue? The party are not asking for a whole-time medical service without a *quid pro quo*; they were willing to give the profession the control asked and an adequate wage.

Dr. BROWN (Johns Hopkins Hospital, U.S.A.) spoke on conditions in the United States. The employers there seemed to take more interest in industrial hygiene. The hospital system recognises the middle-class patient. In all hospitals there are public wards with free beds; some of the patients pay the cost of their keep, $15–17 a week; others paid what they could afford. For private patients the wards are divided by curtains into cubicles; two or three bedded rooms were also provided at slightly higher charges. State-aid provided a certain number of beds which were automatically free; this arrangement works well, but the teaching hospitals had not adopted the system. For private patients grouping of specialists under one roof has been initiated; the consultants worked in adjoining rooms and had a secretary in common.

Dr. GIRDWOOD (St. Andrews Institute) described the system carried out at St. Andrews under Sir James Mackenzie, where a bacteriologist, chemist, and radiologist worked with three panel doctors. Two hours each day were spent on research work on patients selected from the panel patients, who were all seen at the institute. Each member of the staff makes himself *au fait* with a specialty. Research cases are discussed once a week, when provisional diagnoses are made and treatment decided. Continuous notes of the cases are being taken and digested; as time goes on the actual disease will be tracked to its beginnings.

Dr. F. J. BLACKLEY (Bristol) said that more leisure was required if the busy practitioner is to engage in research. A busy evening in the surgery was worth £3–£4 to a doctor; he must be certain that his time, if spent in other ways, would bring him in an equivalent.

Dr. H. B. BRACKENBURY (London) said that the general practitioner was the humaniser whose need had been pointed out; he was also the pivot of the whole system advocated. The consultant, the laboratory, the hospital bed all exist to help the general practitioner. He is the preventer of disease; in the sphere of personal and domestic hygiene he is all-important. He will prevent the need of all these big institutions advocated. He must be a well-educated practitioner and must not be rushed in his work. The pay must be such that he need not see an overwhelming number of patients in order to secure a reasonable income. To obtain this end he would be prepared to accept any arrangement, State or otherwise.

Mr. E. B. TURNER (London) agreed that the doctor who had attended a family throughout a generation did an enormous amount of preventive work; he was given opportunities of stamping out disease in its incipient stages.

Dr. A. FULTON (Nottingham) said that the efficiency of the general practitioner lay in his capacity, his equipment, and his conscience. The State could improve his equipment by providing study-leave, expert advice by consultants, and instruments of precision. You will never get all the patients into hospitals; his (Dr. Fulton's) daily visiting list includes 26–30 patients. The root of the matter lay in the improvement of the conditions under which general practitioners work.

Dr. P. MACDONALD (York) said that although the speakers who opened the discussion were very indefinite as regards actual proposals, it was evident that they were pleading for an assumption by the State of the responsibility for the health of the nation. Although he was enthusiastically in favour of such a proposal, he wished to utter a word of warning. Unless the interference of the State led to a better condition of things any change would be disastrous.

There are three essentials, he said, of a satisfactory State Medical Service. First, the service should be complete. Obviously all the sections of the medical service necessary cannot be established complete at once, but any section dealt with by the State should be dealt with completely. It might, for instance, be possible to set up a State Hospital Service by itself to begin with—and this is, at present, the most important of all medical requirements, but very soon the coördination of all forms of service under the State would certainly be necessary. Second, that the medical profession should have the greatest possible share in the management and control of the service. Third, that provision for the services should be adequate. Unless ample financial provision be made to allow the medical service to be of the very best, then any further interference by the State should be strenuously resisted by the medical profession.

It is doubtful if the politicians have given much thought to the cost of a satisfactory medical service. He has attempted to form an estimate of the cost of a fairly satisfactory medical service for the city of York.

(*a*) General Practitioners' Service: The cost of the present panel service for this year is about £19,100. To extend this to dependents would multiply the cost by three, making a sum of £57,300.

(*b*) Hospital service. The expenditure of the York Hospital for 1919 was about £20,000; the hospital serves a larger area than the city, but the amount apportioned to the city is about £13,000. The community, however, needs thrice its present hospital accommodation; the cost would be approximately £40,000, which might be reduced by the establishment of "paying" beds to £32,000. These figures do not include the payment for medical services, an essential with State control; a minimum amount of £8000 should be allowed for this purpose.

(*c*) Present State Medical Service, including the activities of the Public Health Department, Poor-law, War Pensions, and mental diseases. Some of this medical work could be handed to the general practitioner and the cost merged in those of the practitioner and hospital services. The public health medical officials are at present underpaid; the present cost of about £37,000 could only be slightly reduced to about £32,500.

(*d*) The present Poor-law Infirmary (370 beds). The annual cost is approximately £13,000 of which £11,200 is incurred by the city of York. Only about two-thirds of the beds are used; the cost of the beds required might be estimated at £10,000.

(*e*) Additional Services. The above makes no provision for dental service or the services of such specialists as pathologists, laryngologists, dermatologists, &c. A sum of £7500 might be allotted for this purpose. The sum-total is £147,162 for a population of 80,000; the present cost per head to the State is about 16*s*.; the increase is about 20*s*. Working on these figures the cost to the State of a fairly complete medical service for the whole country would be between 70 and 80 million pounds a year, an increase of between 40 and 50 millions on the present cost without including the sum representing interest and sinking fund on capital costs.

From his experience in connexion with the initiation of the panel service Dr. Macdonald is doubtful if the Ministry of Health is prepared to advise the expenditure necessary for the establishment of an efficient service. Any satisfactory solution of this medical problem is impossible as long as this country is run on its present lines; the politician must be replaced by the scientist, who, if he were free to solve the problem of production, could enable the country to earn even the vast amount of money required for our urgent medical and social needs. All we medical sociologists can do at present is to help to promote a public opinion which will bring peace to the world and to influence the politician to give that endowment to science that will bring about increased production.

EXHIBITION OF SURGICAL AND ELECTRICAL APPLIANCES, DRUGS, AND FOODS.

There were things worth seeing at the exhibition held in the Cambridge Corn Exchange; we doubt whether on any previous occasion there has been offered at these meetings a more scientific or attractive presentation of exhibits.

Surgical and electrical apparatus mainly occupied the field, though there was a good show of drugs, including synthetics and improved antiseptic preparations made by our own manufacturers. On the whole, the section comprising foods was dull and without any outstanding features, if we except the attempts made at some of the stalls to convince the visitor that vitamines had been captured. The fine building, with its admirable lighting provision gave the exhibitors ample opportunity for setting forth their exhibits under favourable conditions, and they did so with artistic regard. The stalls were decorated with good taste, and the exhibits were placed in attractive fashion. In beginning the review of some of the principal objects shown we propose to classify the exhibition into the following divisions: I., Surgical Apparatus, including electrical appliances and scientific instruments; II., Drugs, including antiseptics; III., Special Foods; IV., British Spas; and V., Literary Exhibits.

I. *Surgical Apparatus, including Electrical Appliances and Scientific Instruments.*

The interest of the display of surgical appliances turned largely on the developments arising out of the treatment of injuries and mutilation occasioned by the war. The "P-K" Arm, Ltd., of 8, Southampton-row, London, W.C., showed, for example, mechanical hands and arms described as almost human. The improved types demonstrated are designed specially for manual workers and others who have lost an arm. The successful application of these fittings in the practical affairs of life is remarkable, and shows great ingenuity. The principles underlying the mechanism, together with examples of application, have been described in our columns.[1] The orthopædic appliances of the Gloucestershire Surgical Appliances Co., of 1, Belle Vue Lawn, London-road, Cheltenham, also deserve notice. The construction of these shows

[1] THE LANCET June 8th, 1918, p. 793.

admirable adaptation where mechanical assistance is called for in bodily deformity, arising from disease, war casualties, and so on. In addition to orthopædic appliances, Newlyms, of 24, South Molton-street, London, W., demonstrated an interesting series of artificial limbs adapted to all amputations. The exhibit included special arms for heavy manual workers and attachments adapted for all occupations. Amongst the special features at the stall of S. Rampling, of 8, Regent-street, Cambridge, was the "Kenney" Featherweight Artificial Leg, described as the lightest leg made, suitable for all amputations, the weight of the limb for above-knee amputation being 4¼ lb. An exhibit which attracted great interest was that of Mr. H. Brook, of 8, Parkhurst-road, Sutton, Surrey. Here were models of masks for facial disfigurement, including, amongst other applications, those designed to cover loss of jaw, tongue, and ear. The designs showed great ingenuity, and were studiously inspected by the medical visitors.

Surgeons found in the exhibit of Messrs. John Weiss and Son, Ltd., of 287, Oxford-street, London, W., a profusion of modern instruments which drew their attention. Most of these were well described as new inventions. Another exhibit of up-to-date surgical instruments was that of Messrs. Down Bros., of 21 and 23, St. Thomas-street, London, S.E., the appliances shown giving striking illustration of recent advances. Features of this exhibit were the specimens of aseptic hospital furniture for use in the operation theatres and wards of hospitals. A novel presentation was that of Messrs. Spencer, Heath, and George, Ltd., of 48, 52, 54, Goswell-road, London, E.C., who exhibited examples of their apparatus for carrying out medical gymnastic exercises, designed for the treatment of stiffened joints and weakened muscles. This exhibit proved very attractive in bringing to view useful methods of physical treatment in many directions. The advances in the mechanics of that very important branch of surgery, dentistry, found illustration in the exhibit of the Dental Manufacturing Company, Ltd., of Alston House, Newman-street, London, W., where there was demonstrated a complete equipment for dental supervision and treatment to be used in maternity and child welfare centres, school clinics, and general public service. Amongst a selection of modern surgical instruments, Messrs. Arnold and Sons, of Giltspur-street, London, E.C., showed their latest models of steam and electrically heated high-pressure sterilisers and also an operation table, the important and attractive feature of which is the "Everbrite" metal, a name which explains an obvious claim.

Surgical developments were profusely illustrated on the well-arranged stall of the Surgical Manufacturing Company, of 83 and 85, Mortimer-street, London, W. Here were new examples of guillotines, urethral dilators, ophthalmoscopes, and mention is deserved of the "Surgman" pattern of sphygmomanometer for measuring the maximum systolic blood pressure. This apparatus appears simple in construction, is compact, and an important advantage is that the mercury in the instrument cannot be spilled, a clear drawback to previous designs. The exhibit included a series of sterilisers constructed on scientific lines. As the name implies, the Genito-Urinary Manufacturing Co., Ltd., of 66, Margaret-street, London, W., exhibited a wide selection of genito-urinary instruments, including cystoscopes, urethral dilators, bladder retractors, and so forth, designed by well-known surgeons. Mr. Henry Lewis, of 2, Westmoreland-street, New Cavendish-street, London, W., made a point of deformity appliances, including an unbreakable leg instrument, a splint for the treatment of ununited fractures and trusses adapted for all cases. Messrs. Maw, Son and Sons, Ltd., of 7 to 12, Aldersgate-street, London, E.C., exhibited appliances of surgical interest, including an intestinal retractor (Richardson), useful, it is claimed, when portions of fixed gut deep down in the abdomen have to be sutured or stitches put in the bladder. There was also exhibited a special safety chloroform inhaler, which, amongst other things, provides against air being pumped in the wrong direction and the possibility of liquid chloroform, as such, being projected. A large assortment of surgical instruments of every description was to be seen at the stall of Messrs. Mayer and Phelps, of Chiron House, 59–61, New Cavendish-street, London, W. These comprised urological, gynæcological, ophthalmic, laryngological, nasal, aural, and anæsthetic appliances. The latter included a "safety-first" chloroform inhaler, as in the previous exhibit, guarding against the risk of ejecting chloroform out of the bottle, and Shipway's improved apparatus for the administration of warm anæsthetic vapours was also shown. The main interest of the visitors in the exhibit of Messrs. Hawksley and Sons, of 357, Oxford-street, London, W., appeared to be centred upon the apparatus associated with heart research work, blood-pressure gauges, and hæmocytometers. The instruments shown had the hall-mark on them of well-known pioneers of medical science. A very impressive and artistic exhibit was that of Messrs. Allen and Hanburys, of Plough-court, Lombard-street, E.C. There was here a profusion of surgical requisites and appliances, as well as of fine chemicals.

Electro-medical apparatus was a marked feature of the exhibition, and the developments in X ray outfits—transformers, interrupters, fluorescent screens, and so forth—were of a very interesting character. There was a profusion of apparatus shown also providing currents for galvanism, ionic medication, electrolysis, cautery, sinusoidal current, and faradisation. X Rays, Ltd., of 11, Torrington-place, Gower-street, London, W.C., exhibited a remarkable series of new models of X ray tubes and the electric accessories which their use involves. The new radiator-cooled Coolidge tubes, rectifying their own current, attracted particular attention. With these tubes it is possible to employ a simple high-tension transformer on a main alternating current supply without any mechanical rectifiers.

In addition to radiographic apparatus for general purposes, Messrs. Frederick R. Butt and Co., Ltd., of 60, Conduit-street, Regent-street, London, W., demonstrated a 10-inch coil outfit specially built for dental surgeons, a transformer type of apparatus, and a complete set of accessories for dental radiography. This interesting exhibit included a diathermy apparatus for thermic treatment and surgical operations. The firm, well known in the past as Harry W. Cox and Co., Ltd., has now amalgamated with the Cavendish Electrical Co., Ltd., under the title of the Cox-Cavendish Electrical Co., Ltd., of Twyford Abbey Works, Acton-lane, Harlesden, N.W. They made a special point of their "standard" X ray group, suitable for a large hospital. The important claim is put out that with this group instantaneous radiography may be undertaken, exposures being possible with a gas X ray tube of only a fraction of a second. There should be mentioned also their combined galvanic and faradic switch-table, used on a large scale through the war, which provides the current for galvanism, faradism, and rhythmic interrupted currents. Apparatus for ionic medication, particularly in gynæcology, was shown, special electrodes being designed for the purpose. We have already described the Snook interrupterless machine[2] made in the workshops of Messrs. Newton and Wright, of 72, Wigmore-street, London, W. The apparatus is described as consisting of a rotary converter with direct current, a closed circuit transformer, and secondary rectifier. It is all enclosed in a cabinet with spark-gap milliamperemeter, and so forth, the whole outfit being under ready control. The exhibit includes a simple X ray plant for dental work and a series of well-proved tubes and accessories.

Modern developments in X ray appliances were well illustrated at the stall of Messrs. Schall and Son, of 71–75, New Cavendish-street, London, W., who claim for their outfit that it can be put together in a compact way, and so improvised as occasion requires. Portable diathermy apparatus for operations in the bladder and local treatment formed part of this interesting exhibit. Besides the well-known "galvanoset"

[2] THE LANCET, Jan. 30th, 1909, p. 328.

apparatus, a liquid rheostat for ionisation, galvanisation, electrolysis, and so on, the Medical Supply Association, Ltd., of 167–185, Gray's Inn-road, London, W.C., gave an interesting exhibition of Professor Bergonié's apparatus for the treatment of obesity, cardiac derangement, and conditions set up by deficient elimination. There was here, also, an instructive display of surgical appliances, including operating tables. New electro-medical developments were much in evidence at the stall of Messrs. Watson & Sons, of Sunic House, 43, Parker-street, Kingsway, London, W.C. They made a feature of their high tension transformer, described as an outfit complete in cabinet with either rotary converter for direct current supplies or synchronous motor for alternating current supplies, including close circuit transformer, high tension rectifying disc, large milliamperemeter combined with a trolley switch table fitted with resistance and auto-transformer controls. Altogether this was a fine display of up-to-date X ray apparatus, while it included other electro-medical applications and an exhibit of radio-active substances. Amongst the interesting exhibits on the stall of the Cambridge and Paul Instrument Co., Ltd., of Cambridge, was what is described as the Cambridge Electro Cardiograph, the action of which depends upon the variations of the minute electric currents due to the heart's action causing deflections of a fine fibre forming part of the galvanometer. The current variations are recorded photographically, the magnified image of the fibre being projected on to a camera. The exhibit included well designed microtomes and thermometers giving 24-hours records of the patient's temperature.

(*To be continued.*)

AUSTRALIA.

(FROM OUR OWN CORRESPONDENT.)

Australasian Medical Congress.

ARRANGEMENTS for the forthcoming Australasian Medical Congress to be held in Brisbane in the end of August are well forward. Interest will centre in the decision which is to be made as to the future constitution of the Congress. At present it is open to all reputable members of the medical profession who subscribe. It is proposed that henceforth only members of the British Medical Association will be eligible. A ballot paper with a direct question will be furnished to each member of the Congress, whether he be present at Brisbane or not, so that every member who has paid his subscription, will be able to record his vote in favour or in opposition to the proposed change. The result of the voting will be announced at the final meeting of Congress on Saturday, August 28th, 1920. The discussion at the final meeting will depend upon the result of the ballot. Should it be determined that the Congress as it is constituted at present be discontinued, a consideration of arrangements for future combined meetings of the profession will be needed. In this event, the matter will also be referred to the B.M.A.

Criminal Abortion.

The Commissioner of Police in Victoria recently addressed a circular letter to the general hospitals, asking that the members of the staff should communicate at once to the police any instance coming under their notice of a presumed illegal operation. The reason for such a step was said to be the great increase in such operations, and in order to uphold the law two detectives had been detailed to be at the service of the hospitals at any hour. The hospital committees sought the opinion of their staffs, and the question was ultimately brought before the Victoria Branch, B.M.A. The Council of this body sent a deputation to the Commissioner to point out the difficulties surrounding the proposal, but advised the hospital authorities that the matter would be referred to the Federal Committee of the Association for an opinion.

Alien Enemy Practitioners.

Considerable feeling has been displayed in Sydney and in Brisbane in connexion with the attitude of the Federal authorities towards two practitioners of German origin and training in allowing them to remain in Australia. Both these practitioners were interned during the war, and the contention is that they should have been compulsorily repatriated. The New South Wales branch of the B.M.A. resolved to approach the authorities in the case of Dr. Max Herz, and at a special meeting of the Council of the Victoria branch the following resolution was carried:—

That this Council strongly supports the New South Wales branch in its action regarding interned alien enemy practitioners and in the specific instance of Max Herz.

Personal.

Sir Henry Maudsley is about to retire from active teaching at the Melbourne Hospital. About 1902 he resigned his position as indoor physician at the Alfred Hospital and was elected to a similar post at the Melbourne Hospital, which he has held ever since, being granted leave during his service at the front for four years. At a recent staff dinner Sir Henry Maudsley was presented with a silver token as an expression of the esteem in which he is held by his colleagues. He will join the consulting staff, and will continue to hold his appointment as lecturer on medicine in the University.

The death is announced of Colonel H. W. Bryant, M.R.C.S. Eng., who was a well-known and popular practitioner in Melbourne. Colonel Bryant was one of the first to volunteer for oversea service, and was in charge of field ambulance units and hospitals in the heart-breaking period of disaster in Gallipoli and received mention in despatches for his work. But the strain told on his own health, and he was forced to return to Australia. He was able after a rest to render further valuable aid as a member of referee boards, but never completely regained strength, and died after a lingering illness at the age of 59. The late Colonel Bryant had taken an interest in military medicine for many years before the war, and left Australia with the rank of Lieutenant-Colonel.

HOUSING NOTES.

Remedy for Slums.

THE Special Committee under Mr. Neville Chamberlain, M.P., recently appointed by the Minister of Health to advise him as to the principles to be followed in dealing with unhealthy areas, will shortly issue an interim report dealing specially with London.

The three main impressions so far formed by this Committee are that the problem of the London slums is vast and complex; that it is intimately linked with that of transport and the distribution of houses, offices, and factories; and that any comprehensive reconstruction of slum areas while the housing shortage is so acute is impossible. It is pointed out that 550,000 London people live in unsatisfactory housing conditions, and that nearly two-fifths of this number occupy areas definitely unhealthy. Transport facilities, by not keeping pace with the needs of the growing districts, have added to the difficulties which have compelled labour to remain in the central area, while a constant increase in site values has raised rents; thus the inhabitants have had to measure their accommodation not by their need, but by their purse. Many thousands of houses built for one family are now occupied by two, three, or even more, without any addition to the sanitary conveniences. The condition of working-class houses in London is considerably worse now than before the war, and the combination of overcrowding and deterioration makes the problem of improvement extremely urgent.

Two main alternatives are suggested by way of remedy. The first is to allow the population to expand vertically by building taller houses. This suggestion is regarded by the Committee as quite unsuitable for a working-class population dependent on its own efforts for domestic service and the care of children. Supervision is necessary if the occupants of many-storeyed buildings are not to be at the mercy

of any undesirable tenant and of the spread of infectious disease. Access to playgrounds in the open air is difficult, except by those occupying the lower floors, and construction is no cheaper than that of equivalent accommodation in two-storey cottages. Where such cottages are available, block buildings are left untenanted. The lower floors in high buildings are apt to be sunless; the higher ones bad for women and children. The Committee considers that multi-storey buildings cannot be regarded as making any serious contribution to the solution of the housing problem, and that their erection should be subject to severe restriction both as to height and as to nearness to other buildings.

Redistribution of population.—The second alternative—namely, redistribution of population, the removal of large parts of it bodily elsewhere, rearranging the population left on the old sites with adequate accommodation, and the requisite open spaces—requires time, and must be combined with measures of prevention as well as of cure. No improvement in congested areas can be hoped for if they are allowed to become still more congested by the further demolition of houses to make way for more profitable buildings, and it would seem necessary to discourage any increase of labour-employing establishments in these areas. The Committee is strongly of opinion that side by side with restrictions concerning the slum areas in London there should be encouraged the starting of new industries and the removal of existing factories to garden cities, to contain not more than 50,000 residents, and to be surrounded by a belt of agricultural land. The Committee notes that all past attempts at slum clearance and re-housing have been unconnected with one another and with the problem as a whole. The inter-relation of housing, transport, and industry has not been taken into account. The Committee advocates one general plan for all Greater London, in which exist no fewer than 122 local authorities responsible for housing. A plan should be prepared now which would assign to the various districts their respective functions, so that every reconstruction scheme may conform in its main details to this plan. Further, a body should be set up at the earliest moment with jurisdiction in these matters over an area comprising the Home Counties as well as London. The powers and duties of this body should include: (1) the preparation of a plan for the whole area; (2) general direction of transport development; (3) the adjustment of local finance and rates to bring about an even distribution of the burden among the various local authorities, who would retain their executive powers.

The Committee points out that the effect of slum clearances in the past has often been to push the old inhabitants into adjoining areas which have thus become overcrowded and have eventually degenerated into fresh slums. Where new buildings have been erected in place of those demolished very few of the original occupiers have returned. In six improvement schemes carried out by the London County Council only about 2 per cent. of the displaced population became tenants in the new buildings. "We are not satisfied," says the report, "that any persistent effort has been made to retain these old inhabitants. Generally speaking, we are of opinion that it is wise to avoid sudden change in the conditions and life of the classes under consideration. We believe that the system followed by the late Miss Octavia Hill, by which old houses were carefully repaired and kept under kind but strict supervision might be extended with immense advantage to all concerned pending the possibility of reconstruction." The Committee adds that it does not see how any such extension is to take place under the present system of ownership, and has come to the conclusion that the only way of insuring general improvement is to substitute public for private ownership in unhealthy areas.

PROPOSED EXTENSION OF HAM GREEN HOSPITAL.—Dr. F. R. Seymour, of the Ministry of Health, held an inquiry recently at Bristol in regard to the application of the City Council to borrow £10,605 for the extension of Ham Green Hospital for isolation and tuberculosis cases.

Public Health.

REPORTS OF SCHOOL MEDICAL OFFICERS.

Hull.—The nutrition of the children attending elementary schools in the city of Hull continues to be satisfactory in spite of the abnormal economic situation in the country. The number of children systematically examined during 1919 in the code groups amounted to 14,920. The state of these children as to nutrition was estimated as normal in 77·6 per cent. and good in 8·2 per cent., only 0·14 per cent. being considered to be actually badly nourished. The average body-weights are slightly above those found in the previous year but the estimates of nutrition, as gauged by the general appearance of the children, are slightly below those of 1918. Dr. James W. Fraser, the school medical officer, alluding to this anomaly, considers it to be due to "substitutes for animal food being used, which increase the weight by fattening, but do not make the firm flesh and pink elastic skin which count for much in the estimation of nutrition." Fat is so much lighter than flesh that the increased weights are perhaps more likely to have been due to increased nitrogenous nutriment than to increase in the fatty food or tissues. Verminous condition of the children, both in body and head, has caused a good deal of trouble, and has necessitated prosecution in several instances; 30 parents were convicted and fined for allowing their children to become verminous after having been cleansed at the corporation cleansing station. Unfortunately, 772 children, who had been found to be verminous at the first examination in 1919, left school during the year without being cleansed. With regard to the employment of children out of school hours (619 boys and 22 girls), most of the boys (384) were employed as errand-boys in various businesses. A curious fact is mentioned in regard to this: "The poverty of the district served by a school does not increase, but diminishes, the employment of children attending that school." The figures are described as the opposite of what might be expected if it were on account of the necessities of the parents that children were sent to work out of school hours, and point rather to the thrift of the parents in the better districts and the thriftlessness of those in the poorer. Physical training is carried out with energy and success. An important advance has been made during 1919 by the institution of a "field afternoon" once a week, this now being the practice in 72 departments; from most departments three classes (about 150 children) attend one of the four public parks, or five other open spaces, so that about 10,800 children enjoy a "field" period of one and a half to two hours every week. Football, cricket, rounders, &c., are included in this phase of physical training. The ailments of the children are cared for at three clinics, where 76,749 attendances were registered during the year, chiefly for "minor ailments," eye cases, ear discharge, and dental trouble. Of ringworm of the head there were 428 cases, and of these 338 were cured, the method of treatment being almost entirely that by ethyl iodide, with an average time, for those who attended regularly, of 8·7 weeks. This is extremely satisfactory, and if maintained will obviate the need for installing an X ray apparatus. In the dental department an increasing number of parents are bringing their children for examination and advice, but more instruction in oral hygiene is needed, both for children and parents. The disease that caused most interruption to school attendance was granular ophthalmia, for which 928 children were excluded; this is a serious complaint, when of long standing, but responds quickly to treatment if taken in time; there is therefore all the more reason, as urged by Dr. Fraser, that every doubtful case of inflamed eyes should be seen by the medical officer as early as possible.

Richmond.—Of the 3763 children on the registers of elementary schools at Richmond (Surrey), 1266 were medically examined at the routine inspections in 1919, as well as 772 specially brought forward for medical

advice, and 627 examined by the school dentist. Of these dental cases 62·6 per cent. were found to need treatment, and 61·8 were treated, which is very satisfactory. No children were found to be suffering from actual malnutrition, and only six were recommended to be kept under observation on this account. There was no definite heart disease or pulmonary tuberculosis. Enlarged tonsils, or adenoids, or both, were referred for treatment in 47 cases, and 112 children were kept under observation. There seems to have been an undue prevalence of ringworm, scabies, and impetigo, not in the code groups, but among the school children generally; but with this exception the health conditions of these children in 1919 appear to have been very satisfactory, and Dr. J. H. Crocker, who presents the report, is to be congratulated on the fact that so many of the children recommended for treatment—viz., 1101 out of 1151—were actually treated.

PRESENTATION TO SIR JOHN MACALISTER.

IN the Barnes Hall of the Royal Society of Medicine the presentation took place, on Wednesday afternoon, of a cheque representing the proceeds of the testimonial fund which had been organised on behalf of Sir John MacAlister. The circular announcing the fund was issued on March 1st to every Fellow of the Society, and time was allowed for those Fellows resident abroad to respond.

Sir HUMPHRY ROLLESTON, the President of the Society, in opening the proceedings, remarked that some men were many-sided and touched humanity at many points, and Sir John MacAlister was a very human man. For that reason he had troops of friends of all kinds and in many lands, and those who were present were there to show their affection for him, for he had a genius for friendship. All knew him as the most unselfish and devoted of men, not only great in sympathy, but prompt, even impulsive, to help. The late Sir William Osler, also with an infinite capacity for friendship, described Sir John MacAlister as "the man who pokes the fire," a simile descriptive of the activity which makes things move and produces results.

Sir ARBUTHNOT LANE, the treasurer of the fund, warmly supported the President's remarks, and hinted at the power wielded by Sir John MacAlister in bringing under the notice of the Government practical suggestions of administrative importance which were generally productive of fruitful development.

Mr. PERCY DUNN, honorary secretary to the fund, referred to the warmth of feeling expressed in the correspondence which he had received. Contributions had come from the United States, Canada, India, East Africa, the Argentine Republic, and from Pekin, 11,500 miles distant. The fund, he stated, had proved very popular among the numerous friends whom Sir John MacAlister had attached to himself.

The PRESIDENT then presented the cheque for £711, the amount, after the deduction of expenses, which the fund had realised.

In reply, Sir JOHN MACALISTER was at first reminiscent. He showed that experience, as resident librarian, in Berners-street, had detached him from medicine, a career which in early life he had intended to follow. He became impressed with the conviction that the old Royal Medical and Chirurgical Society was an entity, capable of vast expansion. So it was that his life and his activities became centred in its progress. It touched him more deeply than he could express to have found so many testifying their kindly feelings towards him, and with the utmost sincerity he desired to thank them all from the bottom of his heart. In his concluding remarks he paid a special tribute to the loyalty and helpfulness of the Society's staff, whose faithful and self-denying services, in their varying capacity, had contributed so much to the advancement of the general interests.

ELECTION OF THE HONORARY STAFF TO A HOSPITAL COMMITTEE.—At a meeting of the subscribers to the Liskeard Cottage Hospital, Cornwall, it was decided that the honorary medical and dental staff should in future be ex-officio members of the committee.

ARMY HUTS FOR CONSUMPTIVES.—At a meeting recently held at Tiverton it was decided to purchase two army huts for tuberculous patients, at an estimated cost of about £500. Sir Ian and Lady Amory have contributed £250 towards the expenditure, and have given permission for the huts to be erected on their land.

Correspondence.

"Audi alteram partem."

THE PELLAGRA OUTBREAK IN EGYPT.

To the Editor of THE LANCET.

SIR,—No greater compliment could have been paid to the work done upon pellagra by Dr. J. I. Enright and myself than the fact that it called forth the long letter from Dr. James Goldberger in your last issue. I have the profoundest admiration for the work of Dr. Goldberger, and I would hesitate to cross swords with such an authority if I did not feel that he, like so many great men, was not infallible.

I was afraid when I read Dr. Enright's paper in manuscript that his statement that the diet-deficiency theory of pellagra was exploded did not quite convey his real meaning. It would appear that what he actually intended was that in the case of the German pellagrins no food deficiency could be traced, though such, he admitted, was found among the Turkish pellagrins. This I tried to make clear in my paper by saying that, though most cases could be explained on the diet-deficiency theory, some undoubtedly could not. To account for this latter group I assumed that something else was in operation, and I adduced that the something else was of the nature of a toxin. Now Dr. Goldberger writes that because of Dr. Enright's cases I was forced into the toxin hypothesis. In part that is the truth. He then endeavours to show that Dr. Enright has not proved his case as to the diet of the German prisoners. That being so, my hypothesis is superfluous.

Dr. Goldberger makes much of the point that Dr. Enright did not clearly state that the German prisoners consumed the diet that was ordered for them. Doubtless Dr. Enright himself will supply the evidence for this, but on a priori grounds the objection is a poor one. Does Dr. Goldberger mean to suggest that the German prisoner would not eat his food because he had had such good diet prior to capture that his food as a prisoner was distasteful, or that the flavouring or cooking was at fault? Surely anybody who has seen the Teuton engaged in the engrossing occupation of eating can but smile at such a suggestion. Dr. Goldberger continues with the argument as follows. Because such a relatively small number of prisoners became pellagrous it cannot be that the diet was at fault, but rather the fault must lie with the man himself for not consuming the food supplied to him. Will Dr. Goldberger explain to me why certain of the prisoners would not eat? The various associated diseases were common to all, so that no argument on these lines is of avail. Surely the only answer is that the prisoners who developed a pellagrous rash did not eat because they did not want to, being in the pre-eruptive stage of the disease; or, having eaten, could not assimilate their food owing to the same cause. I maintain, therefore, that a toxin was at work in these cases.

In this connexion I should like to refer to a case at present under my care. About last Christmas the wife of a professional man suddenly lost all appetite and was unable to eat the food that formerly she had relished. About three months later she developed a typical pellagrous rash. Dr. Goldberger will smile and say, "Exactly—food deficiency followed by pellagra." However, there was no reason whatever for her sudden dislike for food, and I feel certain that she did not eat because she already had pellagra, and not that because she did not eat therefore she became pellagrous. Do the majority of phthisical patients become pellagrous? Do those suffering from carcinoma ventriculi or any other wasting disease show evidence of pellagra? Our experience is utterly against such a view. Any unbiased observer must agree that in many of the cases of pellagra something more than a mere food deficiency is present. This something more, I maintain, is probably a toxin.

Food deficiency explains many cases of pellagra, but not all, and if Dr. Goldberger wishes his splendid work

on this subject to live he should consider the ways in which a diet outwardly sufficient may fail to be assimilated by the patient rather than state, with insufficient evidence, that the patient does not eat the food presented to him.

I am, Sir, yours faithfully,

Liverpool, July 3rd, 1920. A. DOUGLAS BIGLAND.

THE INVESTIGATION OF RENAL EFFICIENCY.

To the Editor of THE LANCET.

SIR,—Having read with great interest the paper on the Treatment of Nephritis by Dr. H. MacLean and Dr. A. E. Russell in THE LANCET of June 19th, in particular from the point of view of the increasing means of determining the adequacy or inadequacy of the kidneys, which the laboratory places at our disposal, I am anxious to draw attention to an aspect of the problem (as it presents itself to the clinician), which is not touched upon by the authors. It is this: that the body as a whole presents to us an organism, which, in the process of time, has developed a high degree of specialisation—to this organ the elimination of water and carbonic acid, to that organ the elimination of the nitrogen output, certain salts and water, and so forth, but that the specialisation has not been completed, and that other tissues and organs in minor and minimal degrees cover more or less the same functions. Thus there is no doubt that the bowels and the skin (to name these two only) overlap the kidneys functionally more or less, *even in health;* but that *in disease* it is almost certain that their powers of elimination rise in proportion to the renal inefficiency and to an extent which may convert them into adjuvant or compensatory organs of appreciable value. It comes, then, to this: that it does not suffice, in respect of any particular function, to determine the degree of efficiency of a given organ; in other words, to assess its value. We must go further and endeavour to assess the value of the system at large in respect of this same function. This is where we must hope that the laboratories will come to our aid; but it is just here that we realise the complexity of the problem, and that it will be a long time before it can be adequately tackled. Meanwhile, it is here that the clinician comes in, who, eye to eye with his patient, takes a broad view and endeavours to assess the vitality of the man as a whole, his expectation of life, and, while it lasts, his prospect of living to some purpose. Pending the fuller developments of the science of medicine herein lies its art.

I am, Sir, yours faithfully,

HARRINGTON SAINSBURY.

Wimpole-street, W., July 2nd, 1920.

THE TREATMENT OF NEPHRITIS.

To the Editor of THE LANCET.

SIR,—I was much interested in the paper on certain aspects of nephritis by Dr. H. MacLean and Dr. A. E. Russell, which appeared in your issue of June 19th, and I should like to ask the authors one or two questions as to treatment arising out of their very suggestive article.

1. Is the urea treatment advocated for cases of parenchymatous nephritis with œdema of any value in œdema from other causes—e.g., cardiac?

2. In connexion with the impaired excretion of salt in these cases and consequent accumulation in the tissues, have they any experience of or do they recommend a salt-free diet? I remember years ago it had some vogue with certain physicians; I do not know whether it is still advocated. I never saw any marked result from its use myself, though theoretically it should be of great benefit.

3. With regard to the urea-concentration test, Is there any danger, say in a case of interstitial nephritis, of precipitating an attack of uræmia by administering a large dose of urea to a patient who is already suffering from an excess of urea and similar nitrogenous waste products in the blood?

Further enlightenment from the authors on these three points would be of considerable interest to the general practitioner.

I am, Sir, yours faithfully,

Portsmouth, July 4th, 1920. E. W. DEWEY.

HIBERNATING MOSQUITOES AS CARRIERS OF MALARIA.

To the Editor of THE LANCET.

SIR,—Permit me to thank Dr. C. M. Wenyon for correcting, in THE LANCET of July 3rd, the account of one of his findings on the above subject recorded in my book "Malaria at Home and Abroad." The results of field and laboratory work in Macedonia now communicated by Dr. Wenyon are of great interest in connexion with the occurrence of malarial infections at a time prior to the incidence of the current year's anopheline mosquitoes, and may perhaps be used to explain similar occurrences in England. Most of the infections of local origin in this country happen during August and September, but occasionally infections occur as early as May. These must be due to anophelines (*maculipennis*), which became infected in the previous autumn and lived through the winter; and on p. 91 of my book I mentioned two views relating to the manner in which the malarial parasite might survive in the particular "hibernating" mosquitoes concerned. Having regard to the observations of Dr. Roubaud,[1] who showed in France that sporozoites in the salivary glands of anophelines somewhat quickly degenerate and lose their infecting power, Dr. Wenyon's discovery that in nature the zygote (oöcyst) stage of the parasite retains its vitality in hibernating mosquitoes all through the winter is of great importance. It indicates that the mosquito host plays a less transitory rôle in malarial endemiology than has been ascribed to it hitherto, and explains satisfactorily the occasional occurrence of malarial infection in the spring.

I am, Sir, yours faithfully,

Symons-street, S.W., July 5th, 1920. S. P. JAMES.

THE CLINICAL DIAGNOSIS OF DIPHTHERIA.

To the Editor of THE LANCET.

SIR,—In reply to Dr. H. Drinkwater. He confirms his previous position, which I did not misinterpret in my letter, that naked-eye diagnosis is more important than bacteriological examination, and he goes on to say that the latter has always established the accuracy of his clinical observation. I congratulate him, but in an experience of 13 years' work in fever hospitals of 500 beds or more, during eight of which I was responsible for the instruction of students, I have not been so successful, and I say at once that I cannot correctly diagnose diphtheria from the naked-eye appearance of the fauces.

When Dr. Drinkwater describes and illustrates the criteria on which he relies for his own skill, I maintain that exceptions to every one of them are found with some frequency in the practice of a large fever hospital. Even if they were reliable, all the drawings in the world would not enable him to impart such a degree of proficiency to students and post-graduates as would enable them to dispense with or even minimise the importance of bacteriological examination, and in view of the deaths and infections that are known to every M.O.H and fever hospital M.O. to have resulted from the reliance on naked-eye observation, which is even now quite sufficiently prevalent, I regard his teaching as dangerous to the community. Hence my protest.

Only recently in the examination of a large number of children I found diphtheria bacilli in the throats of many in whom definite faucial abnormalities were present, none of which, however, could I discover in Dr. Drinkwater's paper. The patients were removed to isolation hospitals, where the diagnosis was confirmed by independent observation. As regards scarlet fever, does Dr. Drinkwater seriously advocate waiting for the rash before making a diagnosis? What about the cases that have no rash, many of which can be detected by examination of the fauces in the early and most infective stage. My own experience is that some of these present the criteria which he assigns to diphtheria, and I should be sorry for the inmates of the ward to which

[1] Annales de l'Institut Pasteur, vol. xxxii., No. 9, 1918, p. 452.

anyone who thus relied on the naked-eye appearances would presumably admit them. To sum up. I hold clinical and bacteriological diagnosis to be equally essential because one supplies the deficiencies of the other, and that Dr. Drinkwater has not made out a case for the comparative "importance" of the former.

I am, Sir, yours faithfully,

A. KNYVETT GORDON.

Bedford-square, W.C., July 3rd, 1920.

THE ASSESSMENT OF HAND INJURIES.

To the Editor of THE LANCET.

SIR,—In his very interesting remarks on this subject in your issue of July 3rd, Dr. Francis Heatherley mentions that he would have liked a fuller expression of opinion as to the proportional disability of the loss of the hand as compared with amputation higher up the limb. He is quite correct in stating that "amputation of a hand or complete loss of use is a very serious disability and that a lesser assessment on the usual scale compared with amputation higher up is only justified when the man can be fitted with a useful appliance." In dealing with cases under the Workmen's Compensation and Employers' Liability Acts and also under Common Law this very point has to be seriously considered. Under the Ministry of Pensions there is a hard-and-fast schedule which has to be strictly adhered to.

The recognised policy of conservatism as applied to the surgery of the thumb is equally applicable to the forearm and the arm; especially the former. The longer the stump below the elbow the greater the prospect of being fitted with a useful appliance. Just before returning from France I paid a visit to the École Provinciale D'Apprentissage, Charleroi, an institution for the re-education of the disabled, which, it is interesting to note, was founded in 1908. Here was to be seen a man with both hands off. He had been amputated through the right mid-forearm and at the left wrist. With the aid of suitable appliances he was able to work at brushmaking in a most competent manner.

I am in agreement as to the remarks in reference to artificial arms. The more complicated, the less likely to be used. One artificial hand attached to a 5 inch below-the-elbow stump was recently brought to my notice. It was remarkable for its simplicity, as it consisted of a rigid "thumb" with "fingers" having springs at the joints. The man was able to write perfectly when wearing it. In citing this case (a young man of 25, a bricklayer by trade, now no longer able to follow his former occupation) I might repeat a statement I have made elsewhere that "a serious hand injury may be the means of promoting the sufferer from a lower to a higher grade of occupation."

The supreme importance of trying to get adults and elderly men to follow their pre-war occupations (where possible) may be accepted as one of the first principles in dealing with the reconstruction of the disabled.

I am, Sir, yours faithfully,

Royal Hospital-road, S.W., July 3rd, 1920. J. J. SCANLAN.

NOVARSENOBILLON IN THE TREATMENT OF GUINEA-WORM.

To the Editor of THE LANCET.

SIR,—I have been reading in THE LANCET with very great interest letters written about the treatment of guinea-worm with tartar emetic given intravenously. It may be of interest to your readers, and also to the writers of the previous articles, that I have tried treating cases in my hospital here with N.A.B. and have had good results. I started doing this after reading the first letter, giving 0·15 g. N.A.B. with 20 c.cm. cold, sterilised, distilled water. I would be very glad to hear if any of your readers have had the same experience.

I am, Sir, yours faithfully,

CHARLES GEO. GREY,
Captain; Medical Officer.

Ikot-Ekpene, via Port Harcourt, Nigeria, May 24th, 1920.

THE MEDICAL DIRECTORY, 1921.

To the Editor of THE LANCET.

SIR,—The annual inquiry form has been posted to every member of the medical profession whose address is known to us. If the form has failed to reach any practitioner a duplicate copy will be forwarded upon application. Your obedient servants,

THE EDITORS OF THE MEDICAL DIRECTORY.

7, Great Marlborough-street, London, W. 1, July 5th, 1920.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Capt. G. T. Broatch to be Surgeon Rear Admiral.

Surgeon Commanders to be Surgeon Captains: A. Gaskell, E. J. Finch, F. J. A. Dalton, E. Sutton, A. R. Bankart, M. L. B. Rodd, H. L. Penny, R. A. Ross, D. W. Hewitt.

Lieut. G. C. Angell placed on retired list.

ROYAL NAVAL VOLUNTEER RESERVE.

Temp. Surg. Sub-Lieut. W. G. Robertson's temporary commission terminated.

ARMY MEDICAL SERVICE.

Major and Brevet Lieut.-Col. (temp. Lieut.-Col.) R. B. Ainsworth to be temporary Assistant Director-General, and to retain his temporary rank, vice Major (temp. Lieut.-Col.) A. B. Smallman.

ROYAL ARMY MEDICAL CORPS.

Lieut.-Col. A. M. MacLaughlin relinquishes the acting rank of Colonel.

Capt. J. Bennet, from Special Reserve, to be Captain.

SPECIAL RESERVE OF OFFICERS.

Capt. W. F. McLean relinquishes his commission and is granted the rank of Lieutenant-Colonel.

Capt. W. F. Wood relinquishes the acting rank of Major.

TERRITORIAL FORCE.

Col. Sir G. T. Beatson, late A.M.O., Lowland Division, Territorial Force, to be Honorary Colonel for the R.A.M.C. Units of the Lowland Division, Territorial Army.

The undermentioned officers to be Deputy Assistant Directors of Medical Services to the Divisions shown against their names: Major F. W. Squair, Highland Division; Major (Brevet Lieut.-Col.) H. A. Leebody, Lowland Division; Major C. J. Martin, Northern Division; Major J. Ward, Home Counties Division.

Major (acting Lieut.-Col.) C. J. Martin relinquishes the acting rank of Lieutenant-Colonel on ceasing to be specially employed.

Capt. R. Eager to be Major.

Capt. G. P. D. Hawker resigns his commission and is granted the rank of Major.

Capts. F. M. Hughes, E. S. Brentnall, G. W. C. Hollist, I. C. Keir, C. E. Anderson, A. N. Crawford, and G. F. White resign their commissions and retain the rank of Captain.

1st Western General Hospital: Capt. (acting Major) T. R. W. Armour relinquishes the acting rank of Major on ceasing to be specially employed.

4th London General Hospital: Capt. E. B. Clayton resigns his commission and retains the rank of Captain.

1st London Sanitary Company: Capt. W. C. Lyons resigns his commission and retains the rank of Captain.

ROYAL AIR FORCE.

Capts. M. C. Breese and H. T. Prys-Jones are transferred to the unemployed list.

INDIAN MEDICAL SERVICE.

The King has approved of the retirement of Major-General H. Hendley.

HOSPITAL SUNDAY FUND.—The following are among the amounts received at the Mansion House up to July 7th, when the total sum from all sources had reached £60,000:—

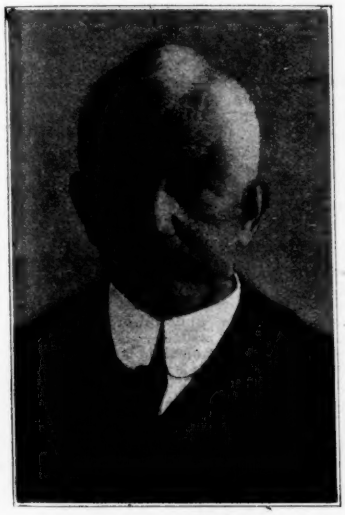
£4000: The Right Hon. the Lady Strathcona and Mount Royal; £1000: Lloyds Bank, Ltd., and the National Provincial and Union Bank of England, Ltd.; £525: Forestal Land, Timber, and Railways Co., Ltd.; £500: London County, Westminster, and Parr's Bank, Ltd., Chartered Bank of India, Australia, and China, and Hong-Kong and Shanghai Banking Corp.; £315: Watts Watts and Co., Ltd.; £300: Sir A. H. Brown; £262 10s.: Sir John Latta; £210: Blyth Greene, Jourdain, and Co., Ltd.; £200: Anon, Bank of Australasia, Lieut.-Col. More-Nisbett, and Thos. Stevens and Sons, Ltd.; £105: Grace Bros. and Co., W. Gardiner and Co., Ltd., United National Collieries, Ltd, Anglo-Egyptian Bank, Ltd., London and Brazilian Bank, Ltd., British Bank of South America, Ltd., Gas Light and Coke Co., Wilson Sons and Co., Ltd., Amalgamated Industrials, Ltd., M. Isaacs and Sons, Ltd.; £100: Alexander Shipping Co., Ltd., Anon, Albert E. Reed and Co., Ltd., Messrs. Dodwell and Co., Ltd., Messrs. Naumann Gepp and Co., Ltd., Messrs. Matthew Wrightson and Co., Ltd., W. Weddel and Co., Ltd., Voile and Wortley, Imperial Bank of Persia, Miller and Richards, Ltd., Balfour Williamson and Co., W. D. Graham-Menzies, J. A. Roberts, Cannon Brewery Co., Ltd., Pierce Leslie and Co., Ltd., C. Tennant Sons and Co., Ltd.

Obituary.

WILLIAM CRAWFORD GORGAS, K.C.M.G., 3

SURGEON-GENERAL, U.S. ARMY.

THE death, after a long illness, of Sir William Gorgas, Surgeon-General of the United States Army, took place on July 3rd at the Queen Alexandra Military Hospital at Millbank. He was the best-known and most uniformly successful medical administrator, not of his age alone but of any age, and his work is comparable only with that recorded of Moses. No sooner were discoveries made tracing an endemic disease to a source removable by rigid hygienic measures than the services of this master-administrator were requisitioned to the farthest quarter of the globe to carry out such measures. And as if by magic—black magic as it appeared to the slovenly, careless inhabitant: white magic to the admiring world outside—the areas were cleansed and freed. But there was no magic other than that wielded by a strong personality with only one idea in mind—the speedy accomplishment of the work of the moment. Havana, Panama, the Transvaal, the endemic regions of yellow fever in South America, Serbia, are only the best-known sites of his activities. Truly he "let observation, with extensive view, survey mankind from China to Peru," though negotiations with Peru itself, whose Government attempted in 1919 to procure his services for a campaign to rid the Republic of yellow fever, malaria, and plague, were then abortive.



WILLIAM CRAWFORD GORGAS,
SURGEON-GENERAL, U.S. ARMY.

William Crawford Gorgas was born at Mobile, Alabama, on Oct. 3rd, 1854, and was the son of General Josiah Gorgas, of the Confederate States Army. He graduated A.B. at the University of the South, Sewanee, Tennessee, and qualified M.D. in 1879 at the Bellevue Hospital Medical College, New York University, where he remained for a year as interne. He was appointed surgeon in the U.S. Army in 1880 and promoted to captain assistant surgeon in 1885, the year of his marriage to Marie Cook, daughter of William Doughty, of Cincinnati, who survives him. His promotion in the service was rapid. He became a surgeon-major and chief sanitary officer of Havana in 1898. In appreciation of his work there he was made colonel, assistant surgeon-general by special Act of Congress in 1903, and surgeon-general, U.S. Army, in 1914. Since 1907 he had been the Permanent Director of the International Health Commission of the Rockefeller Institution, with headquarters at Washington.

The story of the riddance of Havana from the curse of yellow fever has been told often enough, but deserves to be recalled here; for it was typical of Gorgas's work. During the last 45 years of Spanish rule on the island of Cuba the number of deaths from yellow fever occurring annually in the capital, although varying greatly from year to year, was never below 50, and many times exceeded 1000. The work of Major Walter Reed and his colleagues pointed strongly to the prevention of yellow fever being bound up with the destruction of the mosquito *Culex* (now called *Stegomyia*) *fasciatus*, or the prevention of its bites. Major Gorgas, as he then was, lost no time in putting this theory to a practical trial. As he himself tersely phrased it: "The only infected material from the towns looked after was the sick man, who was carefully sought out and screened from mosquitoes." Havana was, and remained, in unrestricted communication with half a dozen infected towns; commerce was not interfered with and no restraint was placed upon the admission of clothing or bedding from infected localities; but under a purely anti-mosquito régime, during the year 1901–02 only five deaths from yellow fever were recorded. Seldom has a scientific discovery been applied so promptly and successfully to an administrative problem.

The magnificent Panama experiment followed. Up to the year 1904 the preliminary campaign waged by the American authorities against climate and disease in the Isthmus had sustained a repulse as decisive as it was regrettable. In May, 1905, Colonel Gorgas was freed from the bonds of red tape that fettered him. President Roosevelt, on his own responsibility and without consulting Congress, compelled the Canal Commissioners to resign, and appointed Judge Magoon as Governor of the Canal Zone with powers little short of autocracy. Under Gorgas and Magoon, the known measures against the mosquito were remorselessly put into force. Every house in Panama was disinfected, stringent measures were taken for the early recognition of cases of yellow fever and malaria, and every inhabitant of the city was inspected by a physician once a day. In addition, the breeding-places of mosquitoes were actively treated, water-tanks and cisterns cleaned and covered in, and a pipe-supply installed. This was in May. The last case of yellow fever occurred in Colon on August 27th and in Panama on Sept. 14th. In October Gorgas and Magoon offered a sum of $50 in gold to any person, not a member of the health department, notifying a case of yellow fever in the Canal Zone. There is no record that any award was made.

In 1913–14, responding to an invitation from the Chamber of Mines at Johannesburg, he made an important investigation into the high death-rate from pneumonia among the native miners on the Rand. Subsequently one of his chief assistants at Panama was offered the post of advisory medical officer to an important group of mines, an appointment which he still holds with excellent results. Two years later found General Gorgas occupied with a survey of the endemic foci of yellow fever in the southern continent of America. During the war he went to Serbia with the Rockefeller Antityphus Mission, and later helped to organise the arrangements for the hygiene of the American Army.

General Gorgas received many official acknowledgements of his work; he was made honorary D.Sc. of several American universities, and, in 1914, of the University of Oxford. The K.C.M.G., his most recent honour, was received from the King personally on June 8th, when he was on his sick-bed.

The reputation of Gorgas as a scientist has been challenged in certain quarters, in view of the fact that he was not responsible for the actual discoveries without which his work could not have been done. For this he needs no defence. Science and art are at their greatest when they join hands, and the man who acts as a link between discovery and its application needs a combination of qualities as rare as those of the pure investigator. It has been too much the pride of the seeker after abstract truth in the exact sciences to care little as to its application. But even when research has been undertaken with the sole aim of finding the cause of an endemic fever or the source of an infection, the successful investigator would often cut a poor figure as the organiser of an expedition to stamp out the scourge in the light of his discoveries. It is not only as a scientist but as a leader of men, as a hero of at least two of the most successful campaigns ever waged, that the name of Gorgas will always be gratefully remembered. The formal procession with the body from Millbank under military escort to St. Paul's, and the ensuing ceremony in the Metropolitan Cathedral, are evidences of the reverence due to a great benefactor of humanity, which in this case are amply called for.

MONTAGU HANDFIELD-JONES, M.D. LOND., F.R.C.P. LOND.,

CONSULTING OBSTETRIC SURGEON TO ST. MARY'S HOSPITAL.

Dr. Handfield-Jones, who died on July 2nd at the age of 65 from heart failure, had been in declining health for some time. Born in 1855, he was the eldest son of Dr. Charles Handfield-Jones, F.R.S., and was educated at Rugby and at London University. As a student at St. Mary's Hospital he showed great promise, winning a scholarship in natural science and an exhibition in classics and mathematics. He qualified in 1879 with the L.R.C.P. and M.R.C.S. Eng., and was subsequently appointed assistant surgeon to St. Mary's Hospital and lecturer on midwifery and diseases of women, and later obstetric surgeon, a post which he held up to a few years ago, when he became consulting obstetric surgeon. Four years after qualifying he graduated M.B. at the University of London, taking honours in obstetric medicine, and in the same year became a Member of the Royal College of Physicians of London. He proceeded to the M.D. Lond. in 1886, and became a Fellow of the Royal College of Physicians of London in 1900. Dr. Handfield-Jones examined in midwifery for the Conjoint Board and for the Universities of Cambridge, London, and Manchester. He was consulting obstetric surgeon to the Paddington Dispensary and surgeon to in-patients at the British Lying-in Hospital. He was at one time president of the Obstetrical and Gynæcological Section of the Royal Society of Medicine, and at another president of the Harveian Society. In 1895 he delivered the Harveian lectures on the Heart in its Relation to Pregnancy, Parturition, and the Puerperal State.

In Dr. Handfield-Jones the profession has lost an acknowledged leader, and a sound exponent of his particular branch of our science.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Treatment and Training of Disabled Men.

Colonel J. S. BOSTOCK, R.A.M.C., Director of the Treatment-Training Branch of the Medical Services Division of the Ministry of Pensions, gave evidence before the Select Committee of the House of Commons on Pensions on Wednesday, June 30th. Colonel BOSTOCK said that the question whether a man was suitable for training under ordinary industrial conditions under the Ministry of Labour or Ministry of Agriculture, &c., or for a course of concurrent treatment and training under the Ministry of Pensions, was determined by medical examination carried out by a medical referee, or a medical board, or the medical officer of a Ministry of Pensions hospital or clinic. Disabled men of the following classes fell to be dealt with by the Ministry of Pensions: (*a*) Men requiring treatment such as would interfere with regular attendance at a continuous course of training on ordinary industrial lines; (*b*) men who were likely to break down or had broken down in training or employment under ordinary industrial conditions; (*c*) men whose condition necessitated concurrent treatment and training in a convalescent centre; and (*d*) men whose disability was such as to make it impossible or undesirable for them to be trained or employed in association with ordinary workmen—e.g., cases of severe facial injury, blindness, or deafness. Cases of men who broke down during a course of training under the Ministry of Labour were transferred to the Ministry if the medical referee was of opinion that treatment was needed for a longer period than three weeks. Under existing arrangements the provision of training, which cannot safely be dissociated from treatment, for tuberculous men (not officers) was a matter for the Ministry of Health, the department at present responsible for the treatment of such cases. Cases requiring concurrent treatment and training were, generally speaking, dealt with either in (*a*) convalescent centres, or (*b*) orthopædic, neurasthenic, and other hospitals. Men were eligible for admission to a convalescent centre if they were suffering from a disability attributable to, or aggravated by, service, and were medically certified to be either unfit to follow their pre-war occupations or unable to follow them without diminution of earning capacity. Medical treatment was prescribed by medical officers resident at the centre, and carried out under their supervision. Nursing and massage services were available. Sick quarters for temporary cases of illness or cases requiring medical observation were provided. The centre also included a dispensary and a large massage room fitted up with modern electrical and other apparatus. The amount of training for which a man was capable was regulated in accordance with his physical ability and was determined by a medical officer. In no case was training carried out at the expense of treatment, which was the primary consideration. The training was in the hands of expert instructors under the supervision of an experienced chief training officer. The training was both theoretical and practical in character. The Treasury had sanctioned the provision of 3300 places in convalescent centres as follows: England, 2500 places; Wales and Scotland, 600 places; Ireland, 200 places. Several of the Ministry's hospitals were equipped with a limited number of workshops in which elementary training of various kinds was given to all cases susceptible of training. The training at these hospitals was mainly of a curative or occupational character, but in some cases it formed the basis of vocational training which was continued as soon as the man was fit to leave hospital, either at a convalescent centre or in a course under the Ministry of Labour. Some of these workshops were in being at the time of the transfer of the hospitals from the War Office; in other cases the training facilities had been provided by the Ministry.

HOUSE OF COMMONS.

WEDNESDAY, JUNE 30TH.

Nurses' Leave in Egypt.

Major BIRCHALL asked the Secretary for War whether there were a number of nurses stationed at the 24th Stationary Hospital, Kantara, Egypt, who had been in Egypt for more than three years without leave and whose contracts had expired; and whether arrangements could be made to bring them home.—Mr. CHURCHILL replied: I have called for a report and will write to the honourable Member as soon as it is received.

Nurses' Pensions in India.

Mr. CAMPBELL asked the Secretary for India if he could state when the revised scale of pensions for officers of the Indian Army departments, lady nurses of Queen Alexandra's Military Nursing Service for India, and for officers of the Royal Indian Marine would be issued.—Mr. MONTAGU replied: The revision of the pensions of the classes referred to is still under consideration, and it is hoped that a decision will be come to shortly.

Scheme for Training Ex-Soldiers.

Mr. LAWSON asked the Minister of Labour whether he would issue a White Paper showing the details of the scheme for training ex-soldiers and setting forth the allowances received by the men at each stage of training.—Dr. MACNAMARA replied: Yes, Sir; I think the suggestion a good one and will forthwith prepare and lay a paper as my honourable friend asks.

Report on Slum Areas.

Lieutenant-Colonel FREMANTLE asked the Minister of Health if and when he would publish the report of the Slum Areas Committee and would say what action he proposed to take on its recommendations.—Dr. ADDISON replied: The interim report of the Committee dealing particularly with the London problem has already been published. The honourable and gallant Member will appreciate that save in so far as reconstruction is possible without material displacement of the population it is unfortunately not practicable to deal on a large scale with slum areas, except in the way of preparing the schemes, until much more progress has been made in providing new houses, which is an additional reason why it is important that the London County Council should press forward with all dispatch with their big housing schemes.

Habitable Houses in London.

Mr. BRIANT asked the Minister of Health if he would state what was the number of empty houses in London fit for habitation at the last available date.—Dr. ADDISON replied: I regret that I am not in a position to give precise information, and I will communicate with my honourable friend in regard to it. I may mention, however, that last year inquiries were made as to empty houses in London and neighbourhood which might be suitable for conversion; that 4300 houses of this kind were considered; that a large number of these houses soon became occupied; and that of the remainder only a small proportion were found to be suitable for conversion.

Colonial Medical Service Report.

Lieutenant-Colonel FREMANTLE asked the Under Secretary for the Colonies if and when he would publish the report of the recent committee appointed to inquire into the conditions of the Colonial Medical Service; and would he say what action he proposed to take on the recommendations of the report.—Lieutenant-Colonel AMERY replied: The com-

mittee referred to has not yet presented its report, and until the Secretary of State has received the report and had an opportunity of considering it, it is not possible to say what action will be taken or whether it will be published.—Lieutenant-Colonel FREMANTLE: When is that report likely to be actually delivered?—Lieutenant-Colonel AMERY: I think it will be very soon. I believe it is being printed at this moment.

THURSDAY, JULY 1ST.

Third London General Hospital.

Sir HENRY HARRIS asked the Minister of Pensions whether the Third London General Hospital, which was to be closed on July 31st, had been offered to the Ministry of Pensions and declined; and whether he would state the number of war pensioners now receiving treatment in civil hospitals.—Mr. MACPHERSON replied: The hospital referred to has been offered to the Ministry, but the accommodation was considered less suitable to the requirements of the Ministry than that of another hospital the transfer of which to the Ministry is being considered. The number of war pensioners now receiving treatment in civil hospitals is approximately 15,000.

Reorganisation of Enfield Cottage Hospital.

Mr. ANEURIN WILLIAMS asked the Secretary to the Treasury whether the trustees of the Enfield Cottage Hospital, the only voluntary hospital in the district, decided last December, in view of its serious financial position, to approve its transfer to the Enfield War Memorial Committee for reorganisation under a new board of management representing the public interests of the whole district; whether this proposed transfer had since then been awaiting the approval of the Charity Commissioners; whether the long delay in completing the transfer was preventing the necessary public appeal for the funds which were so greatly needed; and whether, in view of the very critical situation and the threatened closing of the hospital, the Charity Commissioners would give their sanction to the proposed arrangements without further delay.—Mr. S. BALDWIN replied: The reparation of the scheme for the transfer referred to has been delayed owing to uncertainty as to the intentions of the War Memorial Committee, and to differences of opinion in the locality as to what was required. A scheme has now been drafted, and a print will shortly be in the hands of the War Memorial Committee.

Small-pox in Glasgow.

Mr. ROBERT YOUNG asked the Secretary for Scotland whether any other measures had been taken in Glasgow besides removal to hospital of cases, isolation of contacts, and free vaccination, to deal with the small-pox outbreak; and, if so, what were these measures.—Mr. MUNRO replied: The main additional measures taken by the Public Health Authority of Glasgow are: house-to-house visitation in infected areas; daily visitation of contacts during the incubation period; attention to general sanitation and public cleanliness; disinfection of houses, clothing, and bedding, of cases and contacts; and daily disinfection of tram-cars. In addition, every effort has been made to trace source of infection in every known case.

Medical Examination of Women Pensioners.

Dr. DONALD MURRAY asked the Minister of Pensions whether cases had occurred in which women, on applying for pensions on the ground that they had been deprived of the support of a male relative killed in the war, had been called upon to undergo medical examination in order that their fitness to go out to work might be tested; and, if so, whether he would give instructions for this procedure to be discontinued.—Mr. MACPHERSON replied: My honourable friend probably has in mind those pensions to dependents which are under the Royal Warrant conditional upon the existence of incapacity of self-support through infirmity or age. Where the evidence on this point is open to doubt it is the practice to ask for a medical certificate, which is ordinarily given by the applicant's usual medical attendant. I do not consider that this procedure entails any hardship or calls for revision.—Dr. MURRAY: In the case of a mother whose son contributed to the family exchequer and has been killed, is the policy of the Department to see that the woman is medically examined and certified as fit for work?—Mr. MACPHERSON: My honourable friend is misrepresenting the answer which I gave. There is no desire on the part of the Ministry of Pensions to produce hardship, but in a case where a woman is able to do work my honourable friend will agree that it would be right that we should ask whether she is fit to do work or not. The appropriate way to do that is to ask for a certificate from her own family attendant.

Aged Persons and Sickness Benefit.

Mr. CHARLES EDWARDS asked the Minister of Health whether he would introduce legislation so as to amend the National Insurance Act, 1911, with a view to allowing persons who had been contributors under the Act, and had attained the age of 70 years, having the same benefits of the Act during sickness as persons who had not attained that age.—Dr. ADDISON replied: The extension of sickness and disablement benefits to persons over 70 years of age would necessitate an increase in the contributions payable by all insured persons throughout the whole period of their insurance, and the only persons who would derive any advantage from such increase would be the very small proportion of insured persons who continue in employment up to or beyond the age of 70. The suggested extension would also involve great administrative difficulties, as in the case of the aged incapacity for work through sickness is not distinguishable from infirmity due merely to old age. The experience of Friendly Societies has shown that the risk in question is not one which can properly be covered by insurance, and provision for the needs of aged persons is already made under the Old-age Pension scheme, in which no consideration of incapacity for work is involved. As at present advised, I do not therefore propose to introduce legislation on the lines suggested by the honourable Member.

MONDAY, JULY 5TH.

Registrars of Births.

Dr. MURRAY asked the Secretary for Scotland whether town councils had power to draw up rules and conditions for the registrars of births, and if they did, under what authority did they act, and what power of enforcement did they possess; and were registrars of births appointed during the pleasure of town councils, or could any condition of this kind be made at the time of the appointment.—Mr. MURRAY (Solicitor-General for Scotland) replied: The powers of town councils in this matter are contained in the Registration of Births, Deaths, and Marriages (Scotland) Acts, 1854 and 1856. These Acts provide for the election of registrars by town councils, regulate the tenure of office, the registrar being removable by the sheriff moved thereto by the town council, or by the Registrar-General, and provide for the remuneration of registrars. Registrars act in the performance of their duties under the direction of the Registrar-General, and are under the general control and superintendence of the sheriff.

TUESDAY, JULY 6TH.

Speed Limit of Motor Vehicles.

Mr. RAPER asked the Secretary for the Home Department if he could now see his way to give instructions for the speed limits on motor vehicles to be increased, in view of the great improvements made in their braking capacity since the introduction of the speed regulations now in force.—Mr. NEAL (Parliamentary Secretary to the Ministry of Transport) replied: An alteration in the maximum speed for motor-cars would require fresh legislation. The whole question of speed limits for motor vehicles generally is within the terms of reference of the Departmental Committee on the Taxation and Regulation of Road Vehicles, and I cannot anticipate their report or the legislation which may follow it.

Tetanus in the Former Wars.

Mr. ROBERT YOUNG asked the Secretary for War if he would state what was the attack-rate and death-rate per 1000 wounded men from tetanus in the South African war, the Russo-Japanese War, the Crimean War, and the Franco-Prussian War.—Mr. CHURCHILL replied: There were 6 cases of tetanus among other ranks wounded or injured in action during the South African War, or an attack-rate of 0·28 per 1000; and 3 deaths, or a death-rate of 0·14 per 1000. There were no cases of tetanus among officers. No statistics regarding tetanus are available in the War Office for the other wars mentioned.

EXTENSION OF THE WINSLEY SANATORIUM.—At the last meeting of the Executive Committee of the Winsley Sanatorium, near Bath, it was decided to extend the building by the addition of 45 extra beds and the provision of a house for the senior resident medical officer. The institution will in the future accommodate 160 patients. The chairman (Alderman H. Anstey) expressed regret at the resignation of Mr. H. W. M. Rees, the medical superintendent, and on behalf of the governors alluded with warm appreciation to his valuable services to the sanatorium.

COMMITTEE ON MEAT INSPECTION.—The Ministry of Health announces the appointment of a committee, with Sir H. C. Monro as chairman, to consider and report on the legislative and administrative measures necessary to secure adequate protection for the health of the people in connexion with the slaughter of animals and distribution of meat for human consumption in England and Wales. The medical members of the committee include Dr. W. J. Howarth and Dr. A. W. J. MacFadden, and Mr. T. Parker, F.R.C.V.S., represents veterinary surgery. Mr. F. H. O. Jerram, of the Ministry of Health, has been appointed secretary, and communications for the committee should be addressed to him at the Ministry of Health, Whitehall, London, S.W. 1.

Medical News.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—A meeting of the Fellows of the College was held on July 1st to elect three members of the Council. Sir George Makins, the President, was in the chair. The result was as follows:—

	Votes.	Plumpers.
Sir Anthony Bowlby	473	9
Sir D'Arcy Power	383	3
F. J. Steward	329	58
W. Thelwall Thomas	240	22
Victor Bonney	190	17
J. H. Fisher	180	28
H. S. Pendlebury	167	11

The President declared that Sir Anthony Bowlby and Sir D'Arcy Power had been re-elected and that Mr. Steward had been elected members of the Council. There were 778 postal votes and 6 Fellows voted in person. Mr. H. J. Price, of Maldon, and Mr. Willmott Evans acted as scrutineers.

EXAMINING BOARD IN ENGLAND BY THE ROYAL COLLEGES OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—At the Second Professional Examination, held on June 24th, 25th, 28th, and 29th, the following candidates were approved:—

Part I., Anatomy and Physiology.—C. C. P. Anning, Cambridge; J. M. Bailey, St. Thomas's; S. C. Bakhle, F. J. Biddle, and W. G. Booth, Guy's; C. Brameld, Leeds; E. T. Brice, Middlesex; V. R. de Boissière, Guy's; Gertrude Magdalen de Souza, Madras and London Sch. of Med. for Women; W. de Soyza, Ceylon Med. Coll.; D. Diamond, St. Bart.'s; N. L. Eckhoff, Cape Town and Guy's; R. H. Enoch, Cardiff; Gwladys Evans, Cardiff; G. E. Fisher, Guy's; R. D. Flintan, Middlesex; L. Ghabrial, King's Coll.; A. Gordon, P. Hack, P. G. Harvey, and D. B. Hitchings, Guy's; S. J. Hoffman, Cape Town and Middlesex; M. Honigsberger and M. Jackson, Guy's; J. W. Joule, St. Bart.'s; D. Kostitch, King's Coll.; Catherine Emma Lilian Lendrum, London Sch. of Med. for Women; J. T. Linklater, Cape Town and Guy's; E. Liston, St. Bart.'s; C. R. McClure, London; L. Mather, Manchester; F. R. L. Miller and C. A. Moody, St. Bart.'s; A. L. te W. Naudé, St. Thomas's; E. Orsmond, Cape Town and Guy's; W. Parry-Jones, London; R. C. Peate, Middlesex; C. A. Probert, Guy's; F. R. Ratnagar, Bombay and Guy's; R. P. Rees, Middlesex; C. E. Roach-Smith, London; D. G. Robinson, Guy's; C. V. D. Rose, Univ. Coll.; M. Rose, Cape Town and Middlesex; A. B. Rufail, Cairo and King's Coll.; G. S. Sinnatamby, Ceylon Med. Coll.; A. W. L. Smith, Manchester; Betty Stainer, King's Coll.; S. S. Suzman, Guy's; B. M. Toop, London; M. Weinbren, Cape Town and Guy's; and D. B. Whitlock and H. J. F. Wood, Guy's.

Part II., Materia Medica and Pharmacology.—Annie Dorothy Allen, Liverpool; T. J. D. Atteridge, St. Bart's; H. P. Baylis, Guy's; W. Beaumont, London; W. G. Booth and A. Broido, Guy's; N. E. D. Cartledge, St. Bart's; H. V. Croucher, Guy's; A. Downes, St. Bart's; Winifred Phœbe Edmunds, King's Coll.; R. R. Foote, St. Bart's; M. Garfield, Univ. Coll.; J. P. Helliwell, St. Mary's; J. Herbert, Guy's; G. H. Hogben, St. Bart's; S. P. Jacobson, E. I. Liberman, and J. T. Linklater, Guy's; P. M. Lissack, St. Thomas's; S. F. Mina, King's Coll.; J. N. D. Paulson, St. Mary's; E. F. Peck, Liverpool and St. Bart's; T. H. I. Potts, Sheffield; F. L. Rayner, Guy's; R. P. Rees, Middlesex; J. W. Rigby, Sheffield; C. M. Scott, King's Coll.; A. W. L. Smith, Manchester; A. H. Talaat, Middlesex; D. D. C. Thomson, London; A. K. Wiggins, Middlesex; C. Woode, Charing Cross; and J. Woolff, St. Thomas's.

UNIVERSITY OF MANCHESTER.—At examinations held recently the following candidates were successful in the subjects indicated:—

DOCTOR OF MEDICINE.

F. A. Bearn, S. L. Heald, N. T. K. Jordan, Harold Sheldon, and J. F. Ward.

FINAL M.B. AND CH.B. EXAMINATION.

Nooman Abddh, K. V. Deakin, Georgiana M. Duthie, F. R. Ferguson (distinction in Surgery and Obstetrics), Evelyn A. Garnett, F. G. Hamnett, Joshua Harris, Sylvia K. Hickson, Ernest Jones, F. C. Jones, J. N. Laing, H. A. Lomax, W. E. Mason (first-class honours, distinction in Medicine and Obstetrics), Doris B. Norman, Emily M. Peach, Gerald Sheehan, Constance Snowdon, Annie E. Somerford, G. L. Taylor (distinction in Surgery), Mary I. Turner, F. A. van Coller, and J. B. Wright.

Medicine and Obstetrics.—May Blakiston, J. W. Crawshaw, A. M. El-Aguizy, and Henry Tomlinson.

Surgery.—F. H. Anderson and Percival Fildes.

Medicine.—Irma M. C. Jehansart.

Obstetrics.—H. W. Taylor.

Forensic Medicine and Toxicology.—G. V. Ashcroft (distinction), E. C. Berg, Nancy E. Bleakley (distinction), Muriel Coope, T. E. Coope, Eugenia R. A. Cooper, S. W. Drinkwater, Winifred M. Edghill, T. N. Fisher, Kathleen M. Fullerton, Edward Gleaves, Florence M. A. Graham, W. H. Gratrix, Albert Haworth, Ruth Hill, C. D. Hough, Violet M. Jewson (distinction), Marguerite F. Johnstone, Jessie Kilroe, A. W. Kirkham, R. R. Lane, James Leather, G. H. Lees, Eva G. Le Messurier, W. L. Martland, P. B. Mumford, Terence O'Brien, L. S. Potter, W. E. Powell, Margaret Pownall, Bertha Renshaw, H. L. Sheehan, Florence G. Sherry, Margaret Single, J. W. Smith, Harry Stafford, Doris A. Taylor, S. N. Taylor, Norah M. Walker, Solomon Wand, Sidney Waterworth, Robert Williamson, and J. R. Wright.

THIRD M.B. AND CH.B. EXAMINATION.

Pharmacology, Therapeutics, and Hygiene.—P. D. Abbatt, Reginald Anderton, J. H. Appleton, Mary W. Atkinson, Elsie C. Begg, J. B. Bennett, Doris H. Bentham, Benjamin Broman, G. H. Buckley, Vincent Chadwick, E. W. Clough, H. M. Coope, N. S. Craig, O. M. Duthie, Kathleen M. Eastwood, Beatrice L. Ellison, H. E. Emmett, Caroline M. Edwards-Evans, J. H. Fletcher, William Geraghty, Doris M. Hardman, Arthur Ingham, E. L. Jones, Mary Kent, G. L. Meachim, Nora Mills, Winifred H. Mitchell, A. C. Newman, A. A. Pomfret, Hilda Pratt, G. T. Robinson, Abram Rosenstone, Ragheb Salib, Eleanor P. Smith, Henry Southworth, G. B. Stenhouse, J. H. Struthers, Leo Unsworth, Emmeline Wade, C. B. V. Walker, Margaret Wild, S. J. Woodall, James Worthington, and James Yates.

Hygiene.—Margaret Derbyshire, Gwendolen A. G. Edwards-Evans, F. W. W. Fox, C. B. Kirkbride, G. A. Lord, Dorothea A. C. Partington, and Margaret J. Warburton.

DIPLOMA IN DENTISTRY.

Final Examination.—A. L. Craggs, H. B. Ivers, E. B. Manley, V. W. Morse, H. A. Parkinson, Matthew Raeside, and Alice Ramsdem.

UNIVERSITY OF LIVERPOOL.—At examinations held recently the following candidates were successful:—

DEGREE OF M.D.

G. H. Darlington, P. E. Gorst, Mary E. Illingworth, Phoebe A. Ince, S. D. McAusland, F. C. Plummer, H. G. Roberts, J. F. Roberts, R. E. Roberts, M. B. Strock, and W. R. Williams.

DEGREES OF M.B. AND CH.B. (HONOURS).

Class I.—W. J. Birchall (with distinction in Obstetrics and Medicine).

FINAL EXAMINATION FOR M.B. AND CH.B. DEGREES.

Part I., Pathology.—J. L. Armour, A. V. Campbell, C. H. R. Carmichael, E. N. Chamberlain, Florence M. E. Davies, Helen M. Duvall, F. H. Edwards, M. H. Finegan, W. M. Frazer, P. R. Hawe (with distinction), A. R. Jones, R. M. Jones, C. L. Kopeland, Beatrice M. Niven, and C. Voigt.

Part II., Forensic Medicine, Toxicology, and Public Health.—O. A. Akjaly, F. H. Alexander, *† G. P. F. Allen, *†J. L. Armour, *†J. R. Bhatia, J. S. Bradshaw, †Doris Brown, †W. E. A. Burton, †Doris M. Cassady, †Mildred M. Clegg, *R. W. Cowie, †A. C. Crawford, †Gladys W. Darlington, †I. S. Fox, †W. M. Frazer, †G. L. Gately, W. S. Gilmour, J. Goldberg, *† S. B. Herd, G. M. Hughes, Isabel E. Imison, E. W. Johnson, Isobel K. Johnstone, *R. J. Jones, Irene E. Kenworthy, A. Livingston, F. Q. McKeown, H. R. Madan, †R. F. J. Martin, †J. H. Moorhouse, M. Newman, †J. B. Oldham, †G. W. Phillips, †Kathleen M. Platt, J. H. Pottinger, †A. McK. Reid, J. K. Reid, †T. R. Roberton, Gladys Rutherford, C. F. H. Sergeant, F. C. H. Sergeant, S. G. Sheir, *†S. S. Shrikanth, W. T. de V. Thomson, *L. F. Unsworth, *†S. V. Unsworth, †C. A. Wells, and *†T. A. Williams.

* With distinction in Forensic Medicine and Toxicology.
† With distinction in Public Health.

Part III., Medicine, Surgery, and Midwifery.—Esther Ashworth, Evelyn F. Bebbington, G. N. Campey, J. Flanagan, R. O. Jones, T. M. Jones, D. M. Mather, Annie A. Muir, G. H. Potter, Edith M. Seward, Marguerite G. Sheldon, Nellie Wall, and D. O. Williams.

UNIVERSITY OF DURHAM: FACULTY OF MEDICINE.—At examinations held recently the following candidates were successful:—

THIRD EXAMINATION FOR DEGREE OF BACHELOR OF MEDICINE.

Materia Medica, Pharmacology, and Pharmacy; Public Health; Medical Jurisprudence; Pathology and Elementary Bacteriology.—Sarah Bruce Allan, Alan Angus, Siegfried Annecke, Thomas Henry Bates, Hugh Moray Sutherland Blair, Cecil Colville Carr, Evangeline Carse, James Ferens Coltman, Roy Neville Craig, Walter Nigel Crowe, Richard Leslie Dagger, Robert Alexander McKinnel Dickson, Edgar Reginald Dingle, Hubert Breffit Leaster Dixon, Giles Arthur Michael Hall, Geoffrey Arthur Haydock, Reginald Hickley, Rev. Eustace Vernon Howard, Leonard Hunter, Ella Keidan, Elizabeth Killian, Mona Kirkhouse, Hilda Lodge, Ettie Ormsby McCullagh, Mary Josephine McManus, Abraham Jacob Moskow, Una Mary Mulvany (second-class honours), Peter Murphy, Patrick Joseph O'Connell, Leo Norton Knight O'Neill, Frederick William Markham Pratt, Jacob Victor Reuben, Adéle Constance Robson, Jessie Evelyn Sheret, George Wilson Spark, Gladys Stableforth, Thomas Symington Storey, Weldon Patrick Tyrone Watts, James Whillis, George Wilson, and Henry Arthur Wilson.

UNIVERSITY OF BRISTOL.—At examinations held recently the following candidates were successful:—

THIRD EXAMINATION FOR DEGREE OF B.D.S.

George Norman Season.

THIRD EXAMINATION FOR DIPLOMA IN DENTAL SURGERY.

William Bayly, Leslie Clifford Bodey, Evan Elwyn Lewis, and John Christopher Leslie Phillips.

UNIVERSITY OF ST. ANDREWS.—At examinations held recently the following candidates were successful in the subjects indicated:—

THIRD PROFESSIONAL EXAMINATION FOR DEGREES OF M.B., CH.B.

Materia Medica.—James C. Anderson, Archibald J. Campbell, Cora C. Campbell, David A. H. Cassells, David C. Clark, George R. M. Cordiner, James Craigie, William M. Cumming, Jean M. Davidson, Violet C. Dobbie, William S. D. Elder, Ruby N. Foggie, Charles R. Henderson, Mary M. Jack, William L. Kinnear, Norah M. Lindberg, Annie T. McDonald, Norman McLeod, Jeannie H. Morton, Margaret C. Muir, Janet L. A. Muirhead, Robert Norrie, Sydney S. Ogilvie, John E. Overstead, Alan Pride, Alexander B. Richardson,

Nora A. M. Rodger, Agnes T. H. Shepherd, Lucy C. Simpson, Bhagwant Singh, Edith M. D. Smith, Janet O. Stephen, Arthur K. Tateson, Frances H. Watson, and Thomas Wilson.

Pathology.—Frank E. Anderson, James C. Anderson, Cora C. Campbell, David A. K. Cassells, David C. Clark, George R. M. Cordiner, James Craigie, William M. Cumming, Jean M. Davidson, Violet C. Dobbie, William S. D. Elder, Rubie N. Foggie, Penuel C. Grant, Charles R. Henderson, Mary M. Jack, William L. Kinnear, Norah M. Lindberg, Norman McLeod, Jeannie H. Morton, Margaret C. Muir, Janet L. A. Muirhead, Robert Norrie, Sydney S. Ogilvie, Alan Pride, Alexander B. Richardson, Nora A. M. Rodger, Agnes H. T. Shepherd, Lucy C. Simpson, Bhagwant Singh, Edith M. D. Smith, Arthur K. Tateson, William Thomson, William L. Tullis, Frances H. Watson, and Thomas Wilson.

Medical Jurisprudence and Public Health.—George G. Buchanan, Thomas K. Buchanan, Katharine M. Campbell, Georgina S. Craig, David W. Dawson, William S. D. Elder, Vyvyan S. Ewing, Harry Fisher, Phyllis Fleming, Annie A. Fulton, Alexander H. Harkens, Lazarus Jacobs, Isabella D. Kilgour, Nona S. Lesslie, Katharine D. Macfarlane, Elizabeth W. MacVicar, Isobel M. Mansie, John E. Overstead, Ronald S. Paton, John D. Stewart, Christina J. Thomson, Margaret L. Tod, William L. Tullis, and Margaret H. R. Young.

FOURTH PROFESSIONAL EXAMINATION FOR DEGREES OF M.B., CH.B.

Medicine.—Bessie M. Davidson, Mary Ellison, Frances L. Knipe, Margherita M. Lilley, Christian E. Little, John B. Macdonald, George J. Murray, William G. Robertson, Myles M. Stewart, Eleanor C. Thistlethwaite, Amelia M. Thoms, and Olive M. Whyte.

Surgery.—Bessie M. Davidson, Mary Ellison, Christian E. Little, William G. Robertson, Myles M. Stewart, Eleanor C. Thistlethwaite, Amelia M. Thoms, and Olive M. Whyte.

Midwifery.—Bessie M. Davidson, Mary Ellison, Frances L. Knipe, Margherita M. Lilley, John B. Macdonald, William G. Robertson, Myles M. Stewart, Eleanor C. Thistlethwaite, Amelia M. Thoms, and Olive M. Whyte.

THE price of Colonel L. W. Harrison's "Manual of Venereal Diseases," published by the Oxford Medical Publications, is 16*s.* net, and not as given in our issue of June 19th.

THE ELIZABETH GARRETT ANDERSON HOSPITAL.—The sum of £50,000 for the endowment of 50 beds at this hospital has now been acquired, and the services of Lady Hall, the chairman of the Appeal Committee, have been commemorated in the naming of one of the wards of the hospital now to be called the Sophy Hall Ward.

RONTGEN SOCIETY.—A special meeting of this society will be held on Thursday, July 15th, at 9 P.M., at University College, Gower-street, London, W.C., when an address will be delivered by Dr. W. D. Coolidge, of the Research Laboratories, General Electric Company, Schenectady, New York. Members of medical and scientific societies are invited to attend.

LONDON HOSPITAL MEDICAL UNIT.—A course of 12 lectures on neurology, open to students and graduates of the London Hospital and other schools, is being given on Tuesdays and Wednesdays from July 13th to August 18th at 2 P.M. in the clinical theatre of the London Hospital by Dr. Theodore Thompson, physician to the hospital, and Dr. George Riddoch, of the Medical Unit. The subjects will be announced in our medical diary.

A Summer School of Civics will be held at High Wycombe from July 31st to August 14th. Particular attention will be given to the needs of teachers of civics and of social workers in health and educational movements. Special courses will be provided on the welfare of infants and young children and experiments in the use of leisure. The lecturers will be Dr. Eric Pritchard, Miss Margaret Macmillan, Mr. Wilfred Buckley, Miss Norah March, and Mr. F. H. Haywood. Full particulars may be had from the secretary, Summer School of Civics, Leplay House, 65, Belgrave-road, London, S.W.1.

A SPECIAL post-graduate course will be held at the North-East London Post-Graduate College, Prince of Wales's General Hospital, Tottenham, N., in connexion with the Fellowship of Medicine and Post-Graduate Medical Association, from July 19th to 31st. The fee for the course, to those not Members of the Fellowship of Medicine, is 3 guineas, or 2 guineas for either week. Names of those wishing to attend should be sent not later than July 15th to the Dean at the Hospital (or at 19A, Cavendish-square, W. 1), or to the Secretary of the Fellowship of Medicine at 1, Wimpole-street, London, W. 1.

ITALIAN CONGRESS OF MEDICAL RADIOLOGY.—A Congress under the auspices of the Società Italiana di Radiologia Medica will be held from Oct. 28th to 30th at the R. Istituto di Elettroterapia e Radiologia Medica al Policlinico Umberto I., Rome. Professor Francesco Ghilarducci will preside over the Congress and the secretaries are Dr. Eugenio Milani and Dr. Sordello Aittilj. Those who intend to participate are asked to communicate with the secretaries at the address of the Congress before Sept. 15th.

PUBLIC MEDICAL SALARIES IN SOUTHAMPTON.—A combined meeting of members of the Southampton British Medical Association, Medico-Political Union, Medical Society, Public Medical Service, Local Medical and Panel Committees was held at the Royal South Hants and Southampton Hospital on Wednesday, June 23rd, and was largely attended. The meeting was called for the purpose of discussing the remuneration paid to public medical officials in the borough. Strong comment was made on the totally inadequate salaries which the meeting considered were being paid to the medical officers working for the Southampton Borough Council, and it was unanimously resolved to send a letter to the Council asking for an increase in the salaries by at least 50 per cent. on the following grounds:—

1. The great depreciation in the value of money and the increased cost of living.
2. The increasing importance and responsibility of their work.
3. Fees in other branches of medical work have been raised from 50 to 100 per cent.—e.g., panel practitioners, Seamen's National Insurance, National Deposit Friendly Society, &c.
4. Many other Councils pay better salaries to their medical officers than Southampton does.
5. The remuneration of officials in other professions has been raised.
6. Your medical officers have no pensions, and unless their salaries are sufficient to allow them to save they will have nothing to live on when they retire.

The letter points out that owing to the increase in the number of junior posts in the public health service only a small percentage of men can expect to attain to the position of principal medical officer of health, and unless salaries are raised very materially this is bound eventually to cause a diminution in the number of men and women entering the service, with consequent loss of efficiency.

CONGRESS OF THE ROYAL SANITARY INSTITUTE.—This Congress will be held in Birmingham from July 19th to 24th, under the presidency of Lord Astor, Secretary to the Ministry of Health, who will deliver the inaugural address at the Birmingham and Midland Institute on July 19th at 8 P.M. Besides the sectional meetings and conferences special lectures will be delivered by Sir Frederick Mott and Dr. Andrew Balfour. At the Birmingham and Midland Institute Sir Frederick Mott will lecture on Body and Mind on July 20th, at 8 P.M., when Dr. C. Grant Robertson will preside. Dr. Andrew Balfour will give a popular lecture, illustrated by lantern slides, on Links with the Tropics, at the same Institute, at 7.30 P.M. on July 22nd. The Section of Sanitary Science and Preventive Medicine will meet on July 20th and 21st, under the presidency of Sir Robert H. Firth, and the subjects to be discussed include Mental Defectives, Production of Clean Milk, the Falling Birth-rate, Malaria, Disinfectants, Influenza, Pneumonia and Allied Epidemics. The Section of Engineering and Architecture—over which Mr. W. E. Riley, late superintending architect to the London County Council, will preside—will be devoted mainly to discussions on Housing, Urban and Rural, Reconstruction of Slums, School Buildings, House Drainage, and River Pollution, and will meet on July 22nd and 23rd. The Section of Hygiene of Maternity and Child Welfare will be presided over by Lieutenant-Colonel F. E. Fremantle, and will deal with the Still-birth Problem, Teaching of Sex Hygiene, Infant Welfare Work, and Recreation of Children. This section will meet on July 22nd and 23rd. Councillor Mrs. George Cadbury will preside over the Section of Personal and Domestic Hygiene, which will meet on July 21st, and will consider Choice and Storage of Foods, Child Hygiene and Physical Culture. The Section of Industrial Hygiene, under the presidency of Mr. Neville Chamberlain, M.P., will discuss Industrial Efficiency and Fatigue, Welfare Work in Factories, and the Health of Seamen. Technical conferences have been arranged in connexion with the Congress, and will include meetings of (1) representatives of sanitary authorities, (2) medical officers of health, (3) engineers and surveyors to county and other sanitary authorities, (4) veterinary inspectors, (5) sanitary inspectors, (6) health visitors, (7) rat officers. All sectional meetings and conferences will be held at the University of Birmingham. A health exhibition will be held at Bingley Hall in connexion with the Congress, where the work of the Birmingham Corporation departments is to be illustrated. Delegates are expected from public departments in England, Scotland, and the overseas dominions, from Denmark, France, Holland, Sweden, and from some 600 English boroughs. Fellows, Members, and Associates of the Institute will be supplied with tickets for the Congress on application to the secretary, and tickets will be obtainable at a reception room at the Town Hall, Birmingham, during the meeting. Those not connected with the Institute can obtain Congress tickets (£1 1*s.*, ladies' tickets, 10*s.* 6*d.* each) up to Friday, July 16th, at the offices of the Institute, 90, Buckingham Palace-road, London, S.W.1., and after July 17th in a reception room in the Town Hall.

TYPHUS IN EASTERN EUROPE.—With the support and coöperation of the Secretariat of the League of Nations a Chadwick public lecture on "Health Conditions in Eastern Europe—Typhus a Serious Menace," will be given on Thursday, July 15th, at 5.15 P.M., by Dr. Norman White, Medical Officer of the Ministry of Health, acting as Medical Commissioner, Typhus Commission, League of Nations, in the Large Hall of the Surveyors' Institution, 12, Great George-street, Westminster, Sir William J. Collins in the chair.

THE British Orthopædic Association has unanimously elected King Manuel an honorary member in acknowledgment of his great services to the wounded soldier during the war, especially in the establishment of curative workshops in the special military surgical centres.

THE FEDERATION OF MEDICAL AND ALLIED SOCIETIES.—The annual meeting will be held at 11, Chandos-street, Cavendish-square, W., on Tuesday, July 27th, at 3 P.M. The annual report and balance-sheet will be received, the election of corporate members confirmed, and the officers and executive council for the ensuing year will be chosen. At the general meeting the work of the federation will be reviewed. The need for constructive effort by the medical and allied professions in the reorganisation of the medical services of the country will be emphasised by speakers among whom will be Lord Dawson and Captain W. E. Elliot, M.P.

WEST AFRICAN MEDICAL STAFF.—The following new scale of salaries has been approved:—

Medical Officers: Commencing salary £660, rising by £30 annually to £720, then, subject to confirmation of probationary appointment £720, by £40 to £960, with "proficiency pay" of £72 a year drawn while in the Colony. Free quarters are provided and free passages as at present. Before proceeding beyond £800 officers are required to undergo an approved course of post-graduate instruction.

Senior Medical Officers: £1000, by £50 to £1150, with £100 proficiency pay. Medical officers who have served for three years at the maximum of the lower grade may, if recommended, draw salary as Senior Medical Officers.

Provincial Medical Officers: £1200, plus £240 duty allowance.
Deputy Principal Medical Officers: £1300, plus £260 duty allowance.
Principal Medical Officers: £1500, plus £300 duty allowance.
Director of Medical and Sanitary Services Nigeria: £1700, plus £340 duty allowance.
Sanitary Officers: £1050, by £50 to £1200, plus £210 duty allowance.
Senior Sanitary Officers: £1300, plus £260 duty allowance.

URBAN VITAL STATISTICS.

(Week ended July 3rd, 1920.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at nearly 18 million persons, the annual rate of mortality, which had declined from 13·8 to 10·1 in the seven preceding weeks, further fell to 9·9 per 1000. In London, with a population of nearly 4½ million persons, the annual death-rate was 9·0, or 1·3 per 1000 below that recorded in the previous week, while among the remaining towns the rates ranged from 1·1 in Eastbourne, 2·5 in Acton, and 5·2 in Ilford, to 15·6 in Gillingham, 17·3 in Aberdare, and 20·0 in Blackpool. The principal epidemic diseases caused 233 deaths, which corresponded to an annual rate of 0·7 per 1000, and comprised 88 from infantile diarrhœa, 50 from measles, 45 from diphtheria, 40 from whooping-cough, 8 from scarlet fever, and 2 from enteric fever. Measles caused a death-rate of 2·4 in Leicester and 3·0 in Wigan, but the mortality from the remaining diseases showed no marked excess in any of the towns. There were 1705 cases of scarlet fever, 1603 of diphtheria, and 3 of small-pox under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital, against 1646, 1668, and 3 respectively at the end of the previous week. The causes of 21 of the 3391 deaths in the 96 towns were uncertified, of which 5 were registered in Birmingham and 3 in Liverpool

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2½ million persons, the annual rate of mortality, which had been 12·7, 13·3, and 11·5 in the three preceding weeks, further fell to 11·1 per 1000. The 254 deaths in Glasgow corresponded to an annual rate of 11·9 per 1000, and included 9 from infantile diarrhœa, 5 from measles, 3 from small-pox, and 2 each from whooping-cough and diphtheria. The 63 deaths in Edinburgh were equal to a rate of 9·6 per 1000, and included a fatal case of infantile diarrhœa.

Irish Towns.—The 106 deaths in Dublin corresponded to an annual rate of 13·3, or 1·3 per 1000 below that recorded in the previous week, and included 3 from infantile diarrhœa, 2 each from measles and whooping-cough, and 1 from diphtheria. The 98 deaths in Belfast were equal to a rate of 12·4 per 1000, and included 3 from infantile diarrhœa and 2 from whooping-cough.

Medical Diary.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Thursday, July 15th.

DERMATOLOGY (Hon. Secretary—Henry MacCormac): at 5 P.M.
Cases (at 4.30 P.M.):
Dr. Bunch: (1) Pemphigus; (2) Urticaria Pigmentosa.
Dr. Sequeira and Dr. Willcocks: Case for Diagnosis.
Dr. O'Donovan: Dermatitis from Acarine Parasite in Discarded Figs.

SOCIETY FOR THE STUDY OF INEBRIETY, in the Rooms of the Medical Society of London, 11, Chandos-street, Cavendish-square, W.
TUESDAY, July 13th.—4 P.M., Discussion on Alcohol and Alcoholism in Relation to Venereal Disease, opened by Mr. A. Evans.

SEAMEN'S HOSPITAL SOCIETY, at the London School of Tropical Medicine, Endsleigh-gardens, N.W.
WEDNESDAY, July 14th.—2 P.M., Lecture:—Col. S. P. James: Prevention of Malaria.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, in the Barnes Hall, Royal Society of Medicine, 1, Wimpole-street, W. (by permission of the Royal Society of Medicine).
Short Film Demonstration illustrating Post-Graduate Teaching in Medicine, Surgery and its Specialties will be given on July 12th, by the Fellowship of Medicine, in conjunction with the British Film Institute. Open to all members of the Medical Profession.
MONDAY, July 12th.—5.30 P.M., (1) Dr. Howard Lilienthal: Splenectomy for Banti's Disease. (2) Dr. Charles H. Peck: Thyroidectomy. (3) Dr. Howard Lilienthal: Gastrostomy.

LONDON HOSPITAL MEDICAL COLLEGE.
MEDICAL UNIT, in the Clinical Theatre of the London Hospital, E.
A Course of Twelve Lectures on Neurology, open to Students and Graduates of the London Hospital and other Schools—
TUESDAY, July 13th.—2 P.M., Lecture I.:—Mr. Riddoch: Disorders of Function from Lesions of the Pyramidal Tract.
WEDNESDAY.—2 P.M., Lecture II.:—Dr. Thompson: Causes and Treatment of Hemiplegia.
SURGICAL UNIT, in the Units' Lecture Theatre, London Hospital, E.
Special Course of Lectures open to both Students and Post-Graduates.
Two Lectures on Coli Infection of the Kidney—
WEDNESDAY, July 14th.—4 P.M., Lecture I.:—Mr. F. Kidd.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.
MONDAY, July 12th.—2 P.M., Mr. D. Armour: Operations. 2.30 P.M., Dr. A. Saunders: Visit to Medical Wards.
TUESDAY.—2 P.M., Dr. Burnford: Visit to Medical Wards. 2.30 P.M., Mr. T. Gray: Operations.
WEDNESDAY.—2 P.M., Mr. D. Armour: Visit to Surgical Wards. 2.30 P.M., Mr. Addison: Operations.
THURSDAY.—2 P.M., Mr. D. Armour: Operations. 2.30 P.M., Dr. A. Saunders: Visit to Medical Wards.
FRIDAY.—10 A.M., Dr. Robinson: Gynæcological Operations. 2.30 P.M., Mr. T. Gray: Operations.
SATURDAY.—2 P.M., Dr. Beddard: Visit to Medical Wards.
Daily:—10 A.M., Ward Visits. 2 P.M., In-patient Clinics and Operations.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
MONDAY, July 12th.—2.30 P.M., Mr. J. B. Banister: Gynæcological.
TUESDAY.—9.45 A.M., Lieut.-Col. R. H. Elliot: Selected Eye Cases and Operations. 2.30 P.M., Mr. C. H. Hayton: Laryngological; Dr. J. Metcalfe: Radiology.
WEDNESDAY.—2.30 P.M., Dr. W. J. Oliver: Dermatological.
THURSDAY.—2.30 P.M., Mr. N. Fleming: Ophthalmological. Dr. J. Metcalfe: Radiology.
FRIDAY.—2.30 P.M., Dr. C. E. Sundell: Diseases of Children.
SATURDAY.—3 P.M., Mr. H. W. Carson: Selected Surgical Cases.
Daily:—2.30 P.M., Operations, Medical and Surgical Clinics, &c.

MALE LOCK HOSPITAL, Dean-street, W.
MONDAY, July 12th, WEDNESDAY, AND FRIDAY.—5 P.M., Dr. C. Russ: Demonstration of the Treatment of Gonorrhœa by Electrolysis.

CANCER HOSPITAL, Fulham-road, S.W.
Clinical Lectures on the Diagnosis and Treatment of Cancer.
TUESDAY, July 13th.—4.30 P.M., Mr. C. Ryall: Cancer of the Tongue.
FRIDAY.—4.30 P.M., Mr. C. Joll: Cancer of the Thyroid.

CHADWICK PUBLIC LECTURE, in the Large Hall of the Surveyors' Institution, 12, Great George-street, Westminster, S.W.
THURSDAY, July 15th.—5.15 P.M., Dr. N. White, C.I.E.: Health Conditions in Eastern Europe—Typhus a Serious Menace.

MANCHESTER FRENCH HOSPITAL POST-GRADUATE LECTURES, 24, Acomb-street (behind Whitworth Park).
THURSDAY, July 15th.—4.30 P.M., Dr. A. C. Magian: Chronic Uterine Complaints.

A CORNISH CENTENARIAN.—Mr. E. T. Pearse, of Exevill Farm, near Callington, attained the age of 105 years on May 24th.

Appointments.

Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.*

BURNELL, A., has been appointed Medical Officer for the St. Clement and St. Mary District (Cornwall).

HOLMES, A. H., M.D., Honorary Physician to Ancoats Hospital, Manchester.

MOODY, L. M., M.D. Lond., Bacteriologist and Pathologist to the Medical Department of the Government of Jamaica.

SCALES, F. S., M.D. Camb., University Lecturer in Medical Radiology and Electrology, Cambridge.

King's College Hospital: BICKERTON, J. M., M.R.C.S., L.R.C.P. Lond., Senior Casualty Officer; JOHNS, L. P., M.R.C.S., L.R.C.P. Lond., Second Casualty Officer; PLAYFAIR, K., M.R.C.S., L.R.C.P. Lond., Junior Casualty Officer; RICHARDS, H. A., M.R.C.S., L.R.C.P. Lond., House Anæsthetist; DAVIDSON, A. N. M., M.R.C.S., L.R.C.P. Lond., YOLLAND, R. H., MATTHEWS, W. F., House Physicians; BANES, C. D., M.B., B.S. Lond., ROBERTS, O. W., M.R.C.S., L.R.C.P. Lond., REBURN, H. E., M.B., B.S. Lond., FOULKES, R. K., M.R.C.S., L.R.C.P. Lond., LAWRENCE, R. D., M.B., B.Ch. Aberd., House Surgeons; BANES, C. D., M.B., B.S. Lond., House Surgeon to Eye Department; LUCAS, H. A., M.R.C.S., L.R.C.P. Lond., House Surgeon to Nose, Throat, and Ear Department; ROBERTS, O. W., M.R.C.S., L.R.C.P. Lond., House Surgeon to Urological Department; WOOD, W. S., House Surgeon to Orthopædic Department; SURRAGE, H. J. R., M.R.C.S., L.R.C.P. Lond., Obstetric House Surgeon; CREED, E., M.B., B.Ch. Oxon., Bacteriologist.

Certifying Surgeons under the Factory and Workshop Acts: ATKINS, G. E., M.R.C.S., L.R.C.P. Lond. (Wombwell); FLOOD, C., L.R.C.S. Irel., L.A.H. (Gravesend); USSHER, N. R., L.R.C.P. & S. Irel. (Garstang).

Vacancies.

For further information refer to the advertisement columns.

Ashton-under-Lyne Union.—Asst. Med. Supt. and Asst. M.O. £300.
Bath, Royal United Hospital. Res. M.O. £150.
Birmingham General Hospital.—Res. M.O. £155.
Bloomsbury Dispensary, 12, Bloomsbury-street, W.C.—Res. M.O. £250.
Bradford City.—Female Asst. M.O. £450 plus £67 12*s.*
Bradford Royal Infirmary.—Res. Surg. O. £250. Hon. Dent. S.
Bristol, Cossham Memorial Hospital, Kingswood.—Res. M.O. £200.
Bristol General Hospital.—Cas. H.S. £175.
Bristol Royal Infirmary.—Throat H.S., and Cas. O.
Canterbury, Kent and Canterbury Hospital.—Hon. Dent. S.
Cardiff, King Edward VII. Hospital.—H.S. £200.
Chesterfield and North Derbyshire Royal Hospital.—Jun. H.S. £250.
City of London Hospital for Diseases of the Chest, Victoria Park, E.—Res. M.O. £250.
Colchester, Royal Eastern Counties Institution for Idiots, Imbeciles, and the Feeble-minded.—M.O. £400.
Colchester, Severalls Mental Hospital.—L.T. Asst. M.O. 7 guineas per week.
Derby, Derbyshire Royal Infirmary.—Asst. H.S. and Cas. O. £200.
Dreadnought Hospital, Greenwich.—H.S. £100.
Durham County Hospital.—H.S. £200.
Edinburgh, Royal College of Physicians Research Laboratory.—Supt. £1000. Also Asst. to Supt. £500.
Elizabeth Garrett Anderson Hospital, Euston-road.—Female Clin. Assts. in the Venereal Diseases Dept. £1 1*s.* per session. Also Anæsthetist. £10 10*s.*
Galway, University College.—Prof. of Anat. £658.
Glamorgan County Council.—Female Med. Inspector. £600.
Gloucester County Asylum.—Jun. A.M.O. £300.
Gloucester, Gloucestershire Royal Infirmary and Eye Institution.—H.P. £175.
Hampstead General and North-West London Hospital, Haverstock Hill, N.W.—Cas. S.O. £150.
Hospital for Consumption and Diseases of the Chest, Brompton.—Asst. P.
Hospital for Sick Children, Great Ormond-street, W.C.—H.S. £50.
Huddersfield County Borough Education Authority.—Dent. S. £450.
Huddersfield Royal Infirmary.—Sen. H.S. £250.
Hull Royal Infirmary.—Asst. H.S. £150
Kettering and District General Hospital.—Res. M.O. £300.
London Temperance Hospital, Hampstead-road, N.W.—Asst. Res. M.O. £120.
Maidstone, Kent County Council.—Tuberc. O. £670.
Maidstone, Kent County Mental Hospital.—Jun. Asst. M.O. £300.
Maidstone, West Kent General Hospital.—H.S. £250
Manchester, Ancoats Hospital.—Res. M.O. £150. Two Jun. H.S.'s. £100. Hon. Dent. S.
Manchester Victoria Memorial Jewish Hospital.—Res. M.O. £150.
Middlesex Hospital, W.—Surgical Registrar.
Middlesex Hospital Medical School.—Chair of Radiology. £1000.
Norwich, Administrative County of Norfolk.—Tuberc. O. £600.
Plymouth, South Devon and East Cornwall Hospital.—H.P. £140.
Prince of Wales's General Hospital, Tottenham, N.—Jun. H.P. £120. Also Hon. Asst. S.
Queen Charlotte's Lying-in Hospital, Marylebone-road, N.W.—District Res. M.O. £80.
Roll of Honour Hospital for Children, 688, Harrow-road, W.—Female Hon. Asst. P. and Temp. Asst. P.
Rotherham Hospital.—Jun. H.S. £150.
Royal College of Surgeons of England.—Examiner in Dent. S.
Royal Ear Hospital, Dean-street, Soho, W.—H.S.
Royal Institute of Public Health.—Sen. Demonstrator of Bacteriology.
Ryde, Royal Isle of Wight County Hospital.—Res. M.O. £250.
St. Albans, Herts County Mental Hospital, Hill End.—Locum Tenens M.O. Eight guineas a week.
St. Helens Education Committee.—Dentist. £500.
St. Mark's Hospital for Cancer, Fistula, and Other Diseases of the Rectum, City-road, E.C.—H.S. £150.
Seamen's Hospital, Albert Dock, Connaught-road, E.—H.S. £100.
Sheffield Royal Hospital.—Asst. Cas. O. £150.
Sheffield Royal Infirmary.—H.P. £150.
Sheffield University.—Demonstrator in Anat. £350.
Sunderland Royal Infirmary.—Jun. H.S. £200.
Stafford, Staffordshire General Infirmary.—H.S. £250. H.P. £200.
Staffs Education Committee.—Practitioners under M.O.H. and Sch. M.O. £600.
Swansea General and Eye Hospital.—Jun. H.S. £200.
Townsville, Queensland, Australia.—Director, Institute of Tropical Medicine. £1200.
University College Hospital, Gower-street, W.C.—Hon. Asst. in Ear, Nose, and Throat Department.
Victoria Hospital for Children, Tite-street, Chelsea, S.W.—H.P. and H.S. £100.
Wakefield, West Riding Asylum.—Jun. Asst. M.O. £400.
Walsall General Hospital.—Hon. Asst. S.
Warrington Infirmary and Dispensary.—Jun. H.S. £200.
West London Hospital, Hammersmith, W.—H.S. and H.P. £50. Also Asst. S.
Westminster Hospital School of Medicine, Broad Sanctuary, S.W.—Obstetric Tutor.
Worcestershire County Council.—Asst. County M.O.'s and Sch. Oculist. £500 each.
Worcester County and City Mental Hospital, Powick.—Jun. Asst. M.O. £350.

The Chief Inspector of Factories, Home Office, S.W., gives notice of vacancies for Certifying Surgeons under the Factory and Workshop Acts at Shefford and at Sleaford.

Births, Marriages, and Deaths.

BIRTHS.

HARDY.—On June 29th, at Leigham-court-road, Streatham, the wife of G. Frank Hardy, M.C. (Captain, R.A.M.C.), of Highlands, Champion-hill, S.E., of a daughter.

ROY.—On June 28th, at Lower Belgrave-street, the wife of D. W. Roy, M.B., F.R.C.S., Upper Brook-street, of a son.

MARRIAGES.

CURRIE—HARVEY.—On June 30th, at All Souls, Langham-place, London, Walter Thompson Currie, M.B., Ch.B., to Annie Wallace, eldest daughter of the late Andrew Harvey, of Greenlaw, Woldingham, Surrey, and South India.

GIBSON—CHAPMAN.—On June 29th, at St. John's Church, Putney, Captain Colin Gibson, R.A.M.C., to Lorna Rougier, fourth daughter of G. H. Chapman, Woodboro' Lodge, Putney.

SINCLAIR—BERRIDGE.—On June 24th, at Holy Trinity Church, Brompton, Andrew Fulton Sinclair, F.R.C.S., to Janet Mary, daughter of Mr and Mrs. Charles Berridge, formerly of Ripley, Surrey.

VICK—NEVILLE.—On June 30th, at the Church of St. Martin-in-the Fields, R. M. Vick, O.B.E., F.R.C.S., of the Warden's House, St. Bartholomew's Hospital, to Jane, eldest daughter of M. K. Neville, Esq., 25, Eccleston-square, S.W.

DEATHS.

BLAKE.—On July 3rd, suddenly, at Regent-road, Great Yarmouth, Henry Blake, M.B., B.S. Lond., aged 68 years.

HANDFIELD-JONES.—On July 2nd, Charles Montagu Handfield-Jones, M.D., F.R.C.P., aged 65 years.

SUTHERLAND.—On June 27th, at the Prince of Wales Hospital, Calcutta, of peritonitis after operation, Colonel W. Dunbar Sutherland, Imperial Serologist, M.D., C.I.E., I.M.S.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

NEW HOSPITAL FOR THE TREATMENT OF SURGICAL TUBERCULOSIS.—The Exeter Town Council is joining with Somerset, Devon, and other authorities in erecting a joint hospital for the treatment of surgical tuberculosis. The cost to Exeter is estimated at about £2500 for 10 beds, with £1 5*s.* for maintenance of each bed.

DONATIONS AND BEQUESTS.—**Among bequests** left by the late Mr. Thomas Jeremiah Williams, of Morriston, Swansea, is one of £1000 to the Swansea General Hospital.—By will the late Mr. John Thomas Gipson Clarke, of Leicester, left £1000 to the Royal Infirmary, Leicester; £500 each to the Leicester and County Saturday Hospital Society and the Leicester Guild of the Crippled; £200 each to the Leicester Blind Institute, the Leicester Wycliffe Society for Helping the Blind, the Leicester Surgical Aid Society, and the Institution for Diseases of the Skin.—The late Mr. Edward King Mason, of George-road, Edgbaston, Birmingham, has left by will £500 to the Queen's Hospital, Birmingham; £200 to the Orthopædic Hospital, Birmingham; £200 to Middlemore's Homes; £200 to the Birmingham and District Crippled Children's Union; £200 to the Society for the Prevention of Cruelty to Children, Birmingham.—The Chelsea Hospital for Women has received from an anonymous friend a donation of £200 for its convalescent home at St. Leonards-on-Sea.

Notes, Short Comments, and Answers to Correspondents.

AN INQUIRY INTO THE MENTALITY OF JUVENILE ADULT DELINQUENTS.[1]

BY JOHN M. AHERN, M.B., B.CH., N.U.I.,
MEDICAL OFFICER, H.M. BORSTAL INSTITUTION, BORSTAL.

THE results of an inquiry extending over rather more than 12 months into the mentality of the inmates of H.M. Borstal Institution, Borstal, should be of some interest in regard to the important question of the relationship between "juvenile adult" crime and mental defect. A sentence to a Borstal institution is given to young criminals who are passing through the plastic adolescent period of life—that is, from 16 to 21 years of age. In a few exceptional cases the maximum limit is extended to 23. The name of "juvenile adult" is given to this class of offender. The sentence is either for two or three years, but as a rule for the longer period, in accordance with the recommendation of the Prison Commissioners. The actual period of detention beyond a certain minimum is almost wholly dependent on the conduct of the inmate and the progress he has made in his training, but the longer sentence allows more time for the guidance and observation of his conduct on the conditional discharge, which he earns, and for his return to the institution should this prove unsatisfactory. The after-care is carried out by the Borstal Association, and their function may well be compared to that of a crutch after the removal of splints. To be deprived of its assistance too soon may mean a return of the old condition and the loss of an irreparable chance of its remedy.

The Two-fold Object of Treatment.

The object of the Borstal sentence is twofold—penal and reformatory. Each inmate has to pass through successive stages, in the first of which the penal element predominates, to be gradually replaced by reforming influences until in the final stages it practically ceases to exist and is succeeded by as large a measure of personal freedom and privileges as is compatible with a well-regulated institutional life. The freedom from close supervision, and the sense of trust by which it is replaced, together with the more intimate association with others, is a near approach to the conditions and temptations of the world outside. A most suitable atmosphere is formed for the observation of mentality, and the behaviour of an inmate under these conditions is of itself a mental test of the highest value and significance. One of the beneficent results of the Borstal system is that it affords an opportunity for mental grading which should be of great value in future years when dealing with cases that show an early history of crime. Most of them will have passed through a Borstal institution at the most likely age for tests and observations to show any existing defect, and thus the consideration of the mentality of the offender can take its place in the scales of justice to a much greater extent than is possible to-day.

The depth of the delinquency of the inmates—the extent to which their minds have been formed by criminal habits—has a bearing upon the subject. Almost all have had one or more previous convictions, and have failed to be weaned from their criminal ways by the supervision of the court probation officer. In a few cases a single offence only has been committed, but of an exceptionally serious nature, or under a bad home environment from which removal is an essential preliminary to reformation. Over 90 per cent. of the inmates have been guilty of repeated thefts or allied offences, and practically all have strong and obdurate criminal tendencies which, if fostered by short and repeated terms of imprisonment, would most assuredly lead to their ruin.

Factors Invalidating the Inquiry.

There is one qualification that a juvenile adult offender must have before his admission to a Borstal institution—he must be free from such mental or physical defect as would prevent him from responding to influence and training. On the physical side this does not mean that he must be free from all defect, provided that it is not of such a degree as to prevent his being taught a trade of a sedentary character, such as tailoring or boot-repairing. Similarly, a slight degree of mental dullness is not a bar to admission. The low-grade defective should never come to a Borstal institution, though unfortunately—owing, no doubt, to war conditions—some have crept in who should really have been certified under the Mental Deficiency Act. Thus the proportion of mental defectives found in the institution is not a true estimate of the part played by the defectives in "juvenile adult" crime. How far it underestimates this proportion I have no data to determine. A second factor that might invalidate the results of the inquiry is that it does not include all those sentenced to detention in a Borstal institution within a given time. There was not, however, so far as I know, any special selection of those who were sent, so that they may be taken as a fair sample for statistical purposes. Finally, it must be borne in mind that there would naturally tend to be a concentration of mental defectives, as they would be slow in qualifying for discharge. As a matter of fact, I find that about one-third of those certified defective within the period under review were detained considerably beyond the average time for discharge.

Details of the Investigation.

The inquiry extends from Feb. 1st, 1919, to March 31st, 1920. On the first of these dates there were 434 inmates in the institution, and during the succeeding 14 months 494 additional inmates were received, making a total of 928. This number was too large, and the time at my disposal too limited to admit of systematic grading. Of those already in the institution the most obvious and insistent cases had to be dealt with first, whilst fresh arrivals were put through an examination less exhaustive but sufficient to detect mental defect or to question its existence. These were noted for subsequent detailed examination and inquiry. The work is tedious, fatiguing, and cannot be hurried.

The scheme of examination followed was drawn up rather with the intention of ascertaining the nature of the defect than of attempting to assess the mental age at which development had arrived. The mental tests were selected from various authorities on the subject, and call for no explanation or special recognition.

The investigation was carried out under the following heads:—

A.—Range of information apart from that acquired by rote or school work.

B.—School standard in reading, writing, and arithmetic, with progress being made.

C.—Questions on incidents of past life with a view to testing recent and distant memory.

D.—The following mental tests: 1. Enumeration of 12 objects observed for one minute. 2. Repetition of figures. 3. Repetition of sentences. 4. Taking key off split-ring. 5. Interchange of clock hands. 6. Cancellation of a letter in a printed passage. 7. Copy of two simple diagrams from memory. 8. Giving words of opposite meaning. 9. Successive deductions of 4 from 100 and 7 from 100.

E.—Particulars of past offences.

F.—School and home history.

G.—Employments before admission with wages earned.

H.—Progress in the institution with opinion of his instructors.

I.—Conduct in the institution with any evidence of emotional weakness.

J.—Employment of spare time and use made of library, with inmate's description of books read.

K.—Family history in relation to insanity, "fits," crime, and drink.

There was no pedantic importance attached to the failure to comply with one or more tests. Each case was viewed from the broad standpoint of whether there was a fitness for the competition of life, even in its humblest capacity, or whether it were not kinder to put into operation the powers of a protecting State than send adrift to prey upon society, the helpless victim of his own imperfect organisation.

Results.

Working on this basis 37 inmates were certified under the Mental Deficiency Act. Eleven more were considered to be within the Act, although not actually certified either on account of their transfer to another establishment or their discharge before action was taken. Of 30 inmates who were removed on account of continued misconduct, probably 20 came within the terms of the Act, although the detailed examination and inquiry had not been made. There remain in the institution close on 20 who are, in my opinion, certifiable. To these figures should be added 4 who were certified insane, and may be presumed to have had a pre-existing mental defect. This makes a total of 92 defectives in a population of 928—or approximately 10 per cent. This figure I hold to be a very conservative estimate. It takes no account of the border-line cases and of the large number who show varying degrees of mental defect. The line which marks off those who are certifiable under the Mental Deficiency Act is of necessity vague and uncertain and largely dependent upon the views of the examiner. Individual opinion will, however, be kept in constant check by the knowledge that it will have to be endorsed by subsequent examiners.

The mental defect observed may be considered under three forms according to the predominating features of their blend: (1) defect of intellect; (2) defect of emotional functions (lack of control, mental conflicts, &c.); (3) moral imbecility.

Defect of Intellect.

Defect of intellect much below the average is not difficult to discover or demonstrate. The stage of development which they have reached can be more of less approximately

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gauged by the Binet-Simon method or some modification of it, and expressed in terms of mental age. This measurement was not undertaken, but I can say that no case was certified on the ground of defect of intellect alone who approximated to a development of 12 years. In the bulk of cases certified defect of intellect was so obvious a feature that I class them under this head, but there were few, if any, who did not show some signs of emotional defect as well.

There seems to be a widespread though erroneous view that the mental defect and defect of intellect are synonymous terms. This is not so. Mentality implies something more than intelligence, and so, too, does the defect thereof; in fact, I question whether criminal propensities exist as a result of mere defect of intelligence. How often is the village fool of an amenable and inoffensive disposition, and trusted to play a small though useful part in the life of its community. Unfortunately, there is no measurement for emotional defect as there is for that of intelligence.

Emotional Defect.

Emotional defect of pronounced form most often shows itself in misconduct; this does not, of course, imply that all misconduct is to be attributed to this cause. The misconduct of the mentally defective has as a rule certain well-marked characters which make it easy to distinguish. In the first place, it is purposeless. In this connexion I would again refer to the strong inducements which exist for good conduct in a Borstal institution. Not alone are there privileges to be earned, but there is, above all, a possible discharge after one quarter of the period for which the sentence was given has elapsed. The minimum period of detention has recently been extended, but its contrast to the full sentence must still be a potent influence to the mind of the average lad. Continued misconduct of a purposeless character that sets at naught individual interest is always suggestive of mental defect either on the side of intellect or emotional control. The offender is at least a dullard in the school of experience with an unnatural disregard for his own happiness or an inability to appreciate or be guided by the obvious consequences of his acts. Especially is it suggestive when the misconduct takes the form of destructiveness. An inmate who picks up and smokes a "fag," who steals an egg from the institution farm, or who absconds, takes a reasonable gamble for gain or gratification, although it is interesting to observe that those who have tried to abscond were mostly mentally defective, as experience showed the prospects of ultimate escape to be practically nil. The inmate guilty of this class of rational misconduct is from a mental point of view in an altogether different category from that of one who aimlessly smashes up the institution property or has at most some half-formed illogical idea of "getting his own back."

Emotional defect is not inconsistent with good intelligence, but in the young offender it is most often accompanied by a deficiency in this respect, though not always of a marked degree. It may be described as a riot of emotions in which volition has become usurped. When the fury has spent itself volition regains its weak dominion, but with no greater power of control or of preventing a recurrence of the disorder on the slightest irritation. It manifests itself in a fitful series of explosive acts, most frequently destructive or violent. A mood of repentance follows, with promises of amendment, and later on the paroxysms recur with renewed violence. Asked why they behave in this way, these lads will often say that they cannot help it, or that it gives them relief. Psychic epilepsy is an expressive term for such a condition. The nature or degree of misconduct bears no relation to its cause; it may originate in some trivial or fancied grievance, and not infrequently it is imitative.

Lastly, physical signs of the emotional disturbance may often be noted, such as quivering of the lips, twitching of the facial muscles, or other evidence of motor restlessness or incoördination. Headache and head sensations are frequently complained of. It may be urged that much of the emotional weakness described might be due to an adolescent instability that will pass off when maturity is reached. Their past and family history and the depth of the defect will probably in most cases serve to eliminate those who are only temporarily affected, but even in these cases it is most important not alone to the State but to the individual himself that he should be kept under a controlling supervision so long as the defect continues, as criminal habits formed in this phase are likely to remain when the phase passes off. For this reason a longer period of detention than can be secured by a sentence to a Borstal institution is advisable in some cases.

I have already pointed out that unless cases of emotional defect show also a considerable lack of intelligence their certification is often a matter of the greatest difficulty. Their good behaviour under rigid supervision is no proof that their misconduct is merely badness which they are well able to control. The question is not how the subject of emotional weakness is going to act under purely artificial conditions, but how he is going to act in ordinary life. A soldier urged forward by a revolver to meet the enemy is not accounted a brave man, nor can it be said that his power of self-control is sufficient of itself to overcome his sense of fear or his impulse to run away, and the conditions are not incomparable. However well-behaved and hard-working under close supervision, the subjects of emotional defect are incapable of continued effort or undivided attention when left to themselves. They are excitable, easily distracted, and readily influenced; they are thoughtless, idle, and mischievous, and, in fact, one may say that on the emotional or affective side of the mind they have not developed beyond childhood. Mental tests show that though deficient in attention and judgment they are not much lacking in general intelligence. Their range of general information is good and their standard of education is up to the average of this class. These boys will neither be kept, nor want to remain, long in any employment, and, when out of work, will take the line of least resistance and drift into crime, possibly as the tools of stronger minds. It is exceedingly difficult to know what to do with them. Many will doubtless improve as they grow older, but in others the defect which was the chief factor of the criminality already shown will continue to influence them for some years after their discharge. Unfitted for the competition of life, many of them will, I am afraid, become habitual criminals.

The Moral Imbecile.

The last class of case to which I would refer is the moral imbecile. Of the 37 inmates certified, 5 came under this heading. The whole question of moral imbecility is one beset with difficulties. Some authorities deny the existence of such a class as distinct from the other forms of defect, whilst its limits are various and uncertain. A high authority defines a moral imbecile as one who "has no conception of any social or moral obligation, and is lacking in the higher faculty of control and wisdom," but in my view such a definition does not cover the cases of moral imbecility met with among the criminal classes. Something more is required than a mere passive negation of the moral sense unless it connotes, however illogically, an antisocial perversion of it. Hostile to every regulation and social restraint, certain boys delight in misconduct for misconduct's sake. They treat kindness as a weakness and punishment only stimulates their bad behaviour. The so-called prison lawyer is often a type of this class. They satisfy one condition of the definition of moral imbecile contained in the Mental Deficiency Act—i.e., they show an incorrigible moral perversity; but unless there is other evidence of mental defect this is, from the point of view of responsibility, treated in law the same as any other perversity. In many of these cases evidence of some permanent defect that has existed from an early age may be obtained, and then they can be dealt with under the Mental Deficiency Act as "moral imbeciles." In these cases it is evidently the intention of the Act (and very rightly, in my opinion) that a lesser degree of defect should suffice for their certification than if no strong vicious or criminal propensities existed. With regard to the condition laid down, that punishment must have little or no deterrent effect, this would seem to be satisfied by a continuous history of misconduct from childhood, continuing under reforming influences such as those of a Borstal institution.

The marked correlations between mental and physical development is well exemplified by those who were certified to be mentally defective. Although the average height of the Borstal inmate is over a couple of inches below that of the general population of the same age, the average of the defectives was as much again short of this low standard on their removal from the institution, notwithstanding its excellent dietary and healthy surroundings.

The percentage of Borstal inmates who get re-convicted after their discharge is about 30. This percentage of failures is not too high to be largely accounted for by border-line cases and those who are too severely handicapped by physical defects. I believe that a study of the mentality of these cases will justify the opinion that, given a lad whose mental development is within reasonable limits of the average and whose criminal habits are in the main the result of environment, bad companions, or incompetent parental training, the Borstal system seldom fails to turn him into a law-abiding, wage-earning citizen.

PUBLIC HEALTH IN SIERRA LEONE, 1918.

THE population of the Colony at the last census was 75,572 (41,001 males and 34,571 females). The birth-rate in 1918 was 19 per 1000 and the death-rate 45 per 1000. In Freetown the birth-rate was 20 and the death-rate 62 per 1000. The number of European and American residents in the Colony in 1918 was 1036 (officials 185, non-officials 277, military 574).

The average number of resident European officials was 97. Among these, 158 cases were placed on the sick list for a total period of 1528 days. The average number of days upon the sick list for each patient was 9·67, and the daily average on the sick list 4·18. There were 6 deaths during the year, and 11 officials were invalided, the percentage of invalidings to the total number of residents being 4·84. Registration of births and deaths is compulsory in the Colony,

but not in the Protectorate. The excess of deaths over births registered in the Colony shows an increase this year of over 100 per cent. This excess, however, is due principally to an epidemic of influenza which visited the Colony in the latter part of 1918, and to which 1072 deaths were attributed. The annually recurring excess of deaths over births suggests that the population of the Colony is steadily decreasing, but as there is a constant influx of Protectorate natives into the Peninsula, and as the strict enforcement of the Registration Ordinance presents some difficulty the figures given must be accepted with caution.

The population of the Protectorate in 1911 was estimated at 1,327,560, of whom 3426 were non-natives. This estimate was based on the number of houses on which tax had been paid and on the assumption that so many persons live in one house, the number varying from 5 to 10 per house according to the custom of the tribe. During 1918 both the Colony and Protectorate were visited by a severe epidemic of influenza. It is estimated that two-thirds of the population contracted the disease and that during the month of September 3 per cent. of the native population died from this cause. The number of admissions to the hospital and the total attendance at the different dispensaries of people suffering from malaria showed a considerable decrease. Small-pox in a mild form occurred in various parts of the Colony and Protectorate, but partly owing to the new scheme of locally appointed vaccinators there was a large diminution in the total number of cases. Out of a total of 63,700 vaccinations reported as performed 32,033 were returned as successful.

Anti-malarial Measures.

Anti-mosquito measures on a much more extensive scale than hitherto have been carried out in Freetown. As there was reason to believe that malaria was being introduced into England by crews of ships infected at Sierra Leone, it was considered necessary to adopt more effective anti-malarial measures at the port, and a sum of £20,000 was accordingly set aside for this purpose. Mosquito-breeding plants and trees with natural or artificial cavities were systematically dealt with, and during the year 145 wells were closed. Only one case of yellow fever occurred during the year in Freetown, and, so far as is known, no cases occurred in the Protectorate. No case of plague occurred and no evidence of plague was discovered by the bacteriological examination of the 5987 rats caught during the year. The mean maximum temperature at Tower Hill Observatory was 94·00° F., while the mean minimum temperature was 62·00° F. The rainfall was 103·43 inches. To the European Nursing Home there were 288 admissions during 1918, 150 more than in 1917. The number of war vessels in the harbour and the influenza epidemic were responsible for the increased admissions. There were 25 deaths, which mostly took place a few hours after admission, from influenza and pneumonia.

The number of patients treated at the various hospitals and dispensaries throughout the Colony and Protectorate in 1918 totalled 55,562. At the Leper Asylum there were 3 patients at the beginning of the year. During the year 4 were admitted; 1 died, 1 absconded, and 2 were discharged, leaving 3 in the asylum at the end of the year.

THE FINAL CLOSURE OF THE BRIGHTON PAVILION HOSPITAL.

AN event received with great satisfaction by the inhabitants and visitors on June 25th was the reopening of the roadway through the Royal Pavilion grounds at Brighton. Since its occupation by the military authorities in the autumn of 1914, this roadway has been barred to the public. The fact that the Pavilion Hospital was evacuated of the last patients nearly eight weeks ago, and that the gates were still closed, was the basis of a recent question in the House of Commons, which elicited the news that the hospital would be entirely closed, and the premises handed over to the Corporation by July 14th. There has been yet another cause for agitation among the townspeople. In the latter period of the war, after the withdrawal of the wounded Indian troops, who were first located at the Pavilion Hospital, the hospital was devoted wholly to soldiers who had lost a limb, and this led to the establishment in the Pavilion grounds of some of Queen Mary's workshops. It is the future of these buildings that has provoked so much controversy. In spite of a strong feeling among the public in favour of the retention of the huts in the Pavilion grounds, the Brighton Corporation has decided that they must be removed. It is generally considered that the Pavilion site is an admirable one for the workshops, which at a trifling outlay could easily be made entirely independent of the Royal Pavilion estate. Moreover, the appeal from the Ministries of Labour and Pensions was that the workshops might be allowed to remain, not for all time, but for two years only. Those members of the Corporation who voted for their removal to a hilly neighbourhood amid a dense population seem to have quickly forgotten that these workshops were intended to benefit the men maimed in the war, from the horrors of which Brighton was to a large extent immune.

COTTAGE BATHS.

AT Bradford, the *Local Government Chronicle* informs us, 2,898,905 baths had been taken in 1919 in "cottage baths," institutions originated by the local baths committee in 1906. The first cottage bath establishment was opened in what had been a stable, and 10 more have since been added. It is considered that a number of unpretentious bathing establishments placed near the homes of the persons for whom they are intended, encourage women to go who might not care to go far and might be shy of entering more pretentious buildings with others of a different class from themselves. Overcrowding also is avoided to some extent. Most of the cottage baths at Bradford are set aside for children on four days of the week, and provision is made for taking children to them direct from school. They are supplied with soap and clean towels, the washing of those who are too young to look after themselves is supervised; verminous clothing is cleansed and dried. During the 12 months preceding March 31st, 1919, 73,258 slipper and shower baths were given to children free of charge. The idea appears to be a sound one and to have been carried out on practical lines. The bringing of cleanliness within easy reach of all who may desire it in the way indicated should be possible, whereas any general extension of bathrooms in houses for the working classes would almost inevitably tax the water-supply of most towns beyond reason. Waste of water would make up in some cases for neglect to use the baths in others, and a bathroom not used as such makes an expensive bedroom or lumber-room.

THE CHILDREN'S COUNTRY HOLIDAYS FUND.

WHILE the rise in prices has rendered the work of the Children's Country Holidays Fund more difficult, the cost of living, with its housing and food disabilities, has made the need for giving an annual holiday to the children of our slums all the more pressing. We therefore heartily endorse the appeal of the Earl of Arran, honorary treasurer of the Fund, for financial help in the sending of poor children to the seaside or the country for a fortnight's holiday. The cost for board last year was 9*s*. per week per child; it is now 12*s*. Subscriptions should be sent to Lord Arran at 18, Buckingham-street, London, W.C. 2, or to the bankers, Messrs. Barclay and Co., Ltd., 1, Pall Mall East.

BOOKS, ETC., RECEIVED.

BAILLIÈRE, J. B., ET FILS, Paris.
Le Cœur et l'Aorte. Etudes de Radiologie Clinique. Par Prof. H. Vaquez et Dr. E. Bordet. 3rd ed. Pp. 259. Fr. 20.

LIPPINCOTT, J. B., AND Co., London, Philadelphia, and Montreal.
Brightness and Dullness in Children. By H. Woodrow, Ph.D. Pp. 322. 6*s*.

SHAW AND SONS, London.
The Mechanism and Graphic Registration of the Heart Beat. By T. Lewis, M.D. Pp. 452. 47*s*. 6*d*.

UNIONE TIPOGRAFICO-EDITRICE TORINESE, Milan, Naples, and Rome.
Anatomia Patologica del Sangue e Degli Organi Ematopoetici. Del Prof. Pio Foà. Vol. I., Part 1. Pp. 204.

Communications, Letters, &c., to the Editor have been received from—

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C.—Dr. J. Campbell, Lond.; Dr. E. P. Cumberbatch, Lond.; Mr. G. C. Chubb, Lond.; Dr. R. Coope, Liverpool; Dr. F. C. Cawston, Durban; Sir Frank Colyer, Lond.
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